The Builder.

. XXXIV. No. 1724. SATURDAY, FEBRUARY 19, 1876.

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The Sanitary Movement at the Society of Arts.

IN spite of the blackest fog which has enveloped London during the present season, between thirty and forty gentlemen assembled at the rooms of the Society of Arts, on the 11th inst., in response to an invitation issued by the secretary on the 7th. From the various but not discordant accounts of the meeting which have reached us, we judge that it promises to issue in a movement of practical public utility. It is not the first time that the Council of the Society of Arts have usefully taken up some urgent question of the day. As a rule, we must say to their honour, that it has not been done in the spirit of giving publicity to private crotchets, or to making capital out of matters of general interest. The exact contrary is the case. There is probably no body or association which has attempted, and has accomplished, so much public good, with so little private trumpet-blowing, as the Society of Arts. Whether it is due to the wide area of society from which its members are selected, or to the good taste and good management of its officers and Council, we will not take upon ourselves to say. But the contrast which it presents to some other societies that we might name, in the mode in which it effaces its personality while doing good almost by stealth, is worthy of no mean degree of admiration.

In the present case it is gratifying to the friends of sanitary improvement to learn from what widely different parts of the country, and from what various walks and occupations in life, came the gentlemen who met one another for the first time in John-street on Friday last. Lord Alfred Churchill was in the chair. The task of introducing, or rather of suggesting, the resolutions, mainly fell to Sir Henry Cole. But the character of the proceedings was eminently consultative. The Scylla and Charybdis of new committee meetings were avoided with equal dexterity. There was neither the assemblage of a number of heterogeneous units, with no guidance, with no plan, and with no results except a vast amount of talk; nor the adroit manipulation of a cut and dry scheme as to which all that was sought from the meeting was the sanction of numeric authority. The business to be done was concisely stated on the circular convening the committee. It consisted, according to the document, in three points. They were,—(1), to fix a date for holding a sanitary conference some time after Easter; (2) to settle the steps to be taken for preparing papers and other information for discussion at the conference; and (3) to appoint an executive committee.

In addition to this programme, the meeting discharged the function of actually constituting the General Committee on the Health and Sewage of Towns. Each gentleman present signed the book; and three or four names of absentees were added by general accord. An amusing incident occurred at this part of the proceedings, illustrating the fact that no three dozen Englishmen can possibly meet without some little collision of opinion; but the good feeling and good taste of the majority kept all within very agreeable limits. A gentleman who spoke more than once, with evident knowledge of a multiplicity of details, and who frankly admitted that he was a patentee of a sewage utilisation process which had failed, was objected to by another gentleman, a medical officer, we believe, of an important union, on the ground of being an interested party, and thus disqualified as a committee man. On the other hand, it was pointed out that the perfect ingenuousness with which the patentee had admitted the failure of his process in the important town in which it had been tried supplied the committee with the first of that class of facts which it was their object to collect. Amid general hilarity the patentee was added to the list by a considerable majority.

The first point brought before the meeting to be affirmed by resolution was the limit of the function of the committee. This was, in fact, the very life-blood of the whole scheme. To assemble a body of partisans, each anxious to enforce his own views, is merely to represent the builders of Babel in the costume of the nineteenth century. The right tone was taken at the beginning,—suggested from the chair, and acquiesced in at once by the good sense of the majority of those present. It was resolved that the functions of the committee should be limited to the collection of facts, and that no communications of opinions or of theories should be received. The wisdom of this limit became at once apparent. More than one gentleman, either from innocence or from adroitness, endeavoured to glide in the point of the wedge of his particular hobby; but was promptly and quickly suppressed, in virtue of the fundamental resolution. But for that sagacious measure of police, precipitators and irrigators would have turned the room into an arena for free fight before the meeting broke up.

We have pointed out in these columns (p. 27, *ante*) that the expenditure of the local authorities for public health and convenience had attained, according to the last report, the respectable figure of 10,741,470*l*. The indebtedness of the Urban Sanitary Authorities is returned, for 1874, at 6,030,297*l*.; and if we adopt the estimates of Mr. Purdy, the principal of the Statistical Department, as to the total indebtedness of the local authorities, it must be as much as 9,600,000*l*. On many occasions we have pointed out the fact that this large expenditure of capital remained almost entirely useless, as far as any general experience to be drawn from its employment occurred. The horror of any useful centralisation which was the moving principle of the sanitary legislation of 1872, acted as a direct stopper on the concentration, and consequent diffusion, of information. Manchester derived no light from the expenditure of Norwich. Richmond has no light from the experience of Reading. We foretold that this would be the case, unless certain simple and obvious measures were taken to prevent it. From time to time we have lamented the continuance of this idle and puerile waste of power. From every side, on the 11th inst., echoed confirmations of these views. From one part of the country after another representatives arose to express regret at being unable to ascertain what had been done elsewhere. It was said that Manchester spent 80,000*l*. a year in scavenging, but the speaker had been unable in any way to ascertain how that large sum had been expended. The representative of Richmond deplored the unfortunate state of that town, attacked by sanitary authorities, on the one hand, for not getting rid of its sewage; by river authorities, on the other hand, for turning over its sewage to them, and by every surrounding landowner, if they attempted to drain any outlet through their property. In fact, it became very evident, from this and other statements, that the view which we have expressed of the Act of 1872, that it proposed to purify towns by stopping up the outfall of their sewers, and filling them chock full, was a pretty accurate representation of that consummate piece of legislation. Captain Galton, the inspector before whom the case of Richmond had been heard, was present, and was appealed to by his fellow committee-man to confirm his statement that the ratepayers had been mulcted in some 700*l*. or 800*l*. for "doing the best they could"; and that no one gave them the slightest aid in getting out of their *impasse*.

It was mentioned that the only official information accessible on the subject of the outlay by different districts, and the results of the same, was the slovenly and imperfect return of April, 1873, comprising, in part, the expenditure of 109 Sanitary Authorities. Out of date and imperfect as this paper is, it yet contains some very important facts; and an analysis of the same kind, exhaustively conducted, and brought down to the close of 1875, would give very valuable information. It is information of this kind that it will be the primary object of the committee to collect.

Another point which was not in the programme of the council, but which cropped up with great energy in the course of the discussion, was the impossibility of expecting any useful sanitary action from the medical officers of the various authorities, so long as they are deprived of the

shield of systematic organisation, and of the power of communicating their reports so as to reach a central authority, independently of the action of the local sanitary authorities. Medical officers and other practical men were present, who spoke on this subject with deep and scarcely suppressed feeling. One gentleman stated that to his inquiry of a medical officer, "Why do you not report so and so?" the reply was, "Because it would take the bread out of my children's mouths to do so." A hum of assent from the various country representatives attended this statement.

There is no single point on which we have so frequently and earnestly insisted as this. There was nothing that came before the meeting which appeared to excite such deep and unanimous feeling. We might say that it took the chairman and council by surprise,—were it not for the perfect urbanity and sympathy with which the statements were received. But it certainly formed no part of the programme of the meeting. It emanated spontaneously from the experience of those who were suffering under the mischief. The matter took the form of a resolution that it should be a part of the duty of the committee to inquire into the obstacles to sanitary improvement. This guarded manner of approaching a delicate, as well as a vital, question, met general approval. It was decided that the medical and other sanitary officers should be applied to for information, as well as the mayors or treasurers of towns, and the chairmen of Sanitary Boards. And the general opinion of those members of the committee who appeared to represent the officers of Sanitary Boards was, that their brethren would be ready to communicate facts, but would decline adding comment or opinions.

Mr. R. B. Grantham, as chairman of the sub-committee of the British Association on sanitary matters, offered, subject to the sanction of that committee, to lend to the Health and Sewage Committee the volume containing the result of investigations extending over several years,—the collection of which had cost as much as 3,000*l*. Printed questions had been issued by this committee. The replies had been, Mr. Grantham said, extremely unsatisfactory and unreliable. It appeared that some attempts had been made to verify or correct such information as was received, but that from want of funds the inquiry had as yet but very partial and doubtful results. It rather looked as if the experience of this delegation of the British Association was unpromising, as far as the consequences to be expected from the action of the Society of Arts Committee was concerned. On the other hand, the strong rival interest throughout the country that was evinced by the presence of so many unpaid representatives augurs a more satisfactory result. Indeed, but for the wise barrier erected by the first resolution it is more than probable that the offer of Mr. Grantham would have opened the doors to a speech in behalf of one special mode of disposing of sewage.

Another point which emanated rather from the country than from the council seemed to meet universal assent. It was the statement that what was now needful to do was to get rid of the sewage. The idea of making a profit out of it was admitted, on all hands, to have been the main stop to real progress. It was not asserted by any one that there was no value in sewage. It was not asserted that it must cost more to get at the valuable elements than they were worth. Points of opinion such as these were not even mooted. But it was unanimously felt that as yet there was no information before the public to justify the expectation of profit. It was stated that in many cases where profit had formerly been confidently expected, it had never been realised. On the other hand persons had everywhere been waiting to see whether their neighbours did, or did not, derive adequate returns from expenditure on various theories. Meantime infection was not idle. So the general outcome of opinion was this. No more time is to be lost. We must get rid of the sewage at once. Our first duty is to render it innocuous. If any one can make it pay, so much the better. But we cannot wait for that. We have waited for a great many years, and do not seem any nearer the result. The outside theoretic value, on paper, of a given quantity of sewage is shown. It is not very high per individual. To extract that value, at a less cost than the return, is a problem which may, or may not, be insoluble. It is a problem which, as far as we know, is at all events unsolved. While therefore we will receive any definite tabulated facts that throw light on the subject, we will listen to no more theories, plans, or suggestions. We will go to work to get rid of our nuisances, without waiting any longer in the hope of turning them into gold.

Another point, proposed and unanimously agreed on, was that the subject of water-borne sewage, or the results of the water-closet system, should be considered separately from the details of any other systems for the disposal of *excrementa*, or from what is called dry sewage. This of course includes the earth system, of which, however, no mention was made at the meeting; the pneumatic system, of which we have lately heard so much; the venerable abominations of the cesspool and the midden heap; the absorbent pail system, which found a representative at the meeting; and many others. It seemed to be rather the hope of the committee that some member would draw up for the Conference a systematic account of all the various systems now known or proposed. Some such abstract, indeed, is necessary as the backbone or index of any tabulations of the information to be collected. It is probable that the most valuable result of the inquirers of the committee will be the light it throws on the financial value of different plans. It was admitted, all round, that no hard-and-fast rule was to be laid down in the first instance. It was possible that a certain method might be applicable, in one instance, and inapplicable in others. What was wanted was to know the outcome of each individual experience. What plans had been tried? How had each succeeded? If it had failed, what was the cause of the failure? A systematic catalogue of the different methods would form the best skeleton for a report of this nature.

The names proposed for an executive committee of five, to arrange for the meeting of the conference, were received with unanimous approval. They were—Lord Alfred Churchill, the chairman of the meeting; Sir Henry Cole; Col. Du Cane, R.E.; Capt. D. Galton, R.E., C.B.; and Professor F. A. Abel, F.R.S.

It was finally resolved that the conference should assemble, at the rooms of the Society of Arts, on Tuesday, the 9th of May. It was hoped that by that time the executive committee would have organised engineers throughout the country, would have received much valuable information, and would have arranged a programme for the proceedings of the conference. The selection of a time most convenient to the country delegates was discussed, and the expressed intention of these gentlemen to come up to London to be present at the conference, gives promise that the matter is not likely to end in smoke. It was thought that the conference would probably occupy the remainder of the week in question—the hours of meeting being from eleven to four—with a break for luncheon.

We must not disguise from ourselves the fact that it is one thing to ask for information and another to obtain it. We very strongly suspect that, in order to bring to a good conclusion what has been begun under very good auspices, it will be necessary to have travelling inspectors as agents of the committee. A day spent at each place where works have been executed, by an engineer authorised by the conference, would have more practical and valuable results than a twelvemonth of correspondence with local authorities. At least, such would be the case in most places. We do not at all mention this as reflecting on the sagacity of the plan adopted. No doubt, correspondence should, in the first instance, be attempted. But we see that, even in the case of returns ordered by Parliament, there is often extreme difficulty in obtaining proper replies. The Englishman, as a rule, dislikes to be questioned. If he is an ignorant Englishman, we may go further. We may say he will not be questioned; or, at all events, will not reply, and suspects and dislikes his questioners. Pretty certainly those various local authorities whose inaction is the cause of the present movement will do very little to aid it. We even question how far the local medical or other officers may render themselves obnoxious to their boards if they reply to the questions which may reach them. At all events, personal investigation may do much. To that, sooner or later, we shall probably find that it is necessary to have recourse. Nor is the necessary expense so very overwhelming.

It may be said by those who are anxious to do all in their power to maintain the vested rights of filth, that the Council of the Society of Arts, in this matter, are invading the province of the Local Government Board. We may at once admit that they are now attempting to do what we have again and again urged that the Local Government Board ought to have done. But such action is in conformity with the most time-honoured traditions of the British constitution. The very idea and scheme of Parliament is that of an assembly in which the representatives of property and of educated opinion meet to counsel the servants of the sovereign. It is open to any peer, or to any commoner, to submit a resolution to the House of which he is a member, or to ask for leave to bring in a Bill; which, if passed, forms thereafter an integral part of the statute law. Not only is this our principle, but it is our constant and invariable practice. It sometimes happens that, when a matter has been long neglected, a private member will introduce a Bill for its regulation; and that, when he has fairly brought the subject before the House, the Minister in whose department it falls will express his own readiness to take up the matter on behalf of the Government, if the mover will leave it in his hands. We should not feel greatly surprised if something of the same kind were to result in the present instance. If so, the Society of Arts, without relaxing their watchful attention to the great subject which they now have taken in hand, might well be willing to see the details, which they can only obtain by courtesy, or at their own expense, collected under the authority of the Local Government Board. No further legislation, we should conceive, would be necessary to enable that to be done. In that case the Society would enjoy almost a more satisfactory triumph than if they had executed every detail of their task, as well as brought the matter fully before the public.

THE ERECHTHEUM AT ATHENS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary general meeting of this Institute on Monday, the 14th inst., Sir G. G. Scott, R.A., president, in the chair, the following new members were elected, viz.:—Mr. Richard Armstrong, of Westbourne-park, as a Fellow; and Messrs. John Dunn, of Wellington-road, and E. H. Harbottle, of Exeter, as Associates.

The President announced that the Council had unanimously resolved to recommend to the general body that the name of M. L. J. Duc, architect, of Paris, should be submitted for her Majesty's approval as the recipient of this year's Royal Gold Medal.

In reference to the objectionable circulars to which exception was taken at the last meeting of the Institute, Mr. Burges asked whether the secretary had communicated with the person who sent them to the Institute rooms, expressing the indignation of the Institute at the insulting offer which they contained; and, if so, whether any reply had been received?

The President said that the inventor of the appliance referred to in the circulars had been written to, and had replied, excusing himself as well as he could by saying in effect that he had no intention of offering the members of the Institute a percentage upon orders obtained from their clients; but that if they wished to use the invention for themselves, they might strike the percentage off the cost. This explanation was received with laughter.

The secretary called attention to a number of drawings on the walls, exhibited by Mr. W. G. Davie, Soane Medallist for 1871, and explained that Mr. Davie had been prevented by illness from fulfilling the usual condition as to Continental travel and study at an earlier period.

The President said it was the intention of Mr. Davie to publish these drawings, and some of the members might feel disposed to subscribe to the work, which was to be entitled "Architectural Studies in France."

The President also announced that, in reference to the affairs of the Institute, the Council were taking steps to carry into effect a resolution passed at a special general meeting, on the 7th inst., requesting them to act on the authority of bye-law 30a, "and invite the past Vice-Presidents to attend their meetings on this subject, and take part in their deliberations; and also to appoint sub-committees (not necessarily exclusively members of the Council) to consider the several heads into which the inquiry would divide itself, and to report thereon to the Council, each sub-committee to appoint a chairman, who *shall* be a member of the Council, and a secretary,

who may be an Associate, and to be subject to such regulations as the Council may lay down."

Mr. James Fergusson, F.R.S., then read a paper "On the Plan and Architectural Arrangements of the Temple of Erechtheus on the Acropolis at Athens." He commenced by referring to the numerous attempts which had been made, not only in this country, but in Germany, France, and elsewhere, to explain the peculiarities of this very exceptional building. All had failed, as he said, because the problem as hitherto stated was practically insoluble. Besides two tombs, there were three temples in this group. Firstly, that of Minerva Polias, the largest and most important; next, that of Erechtheus; and lastly, that of the nymph Pandrosos. On the other hand, we knew, not only from Pausanias, but from the existing remains, that the building now standing was only double, and contained only two apartments. The puzzle was, how to get these buildings into two. The solution proposed by Mr. Fergusson was that the Temple of Pandrosos was not in the building as it now stands, but over a separate enclosure, attached to it on the west side. He then proceeded to read the various passages in Pausanias, and in the inscription brought home by Dr. Chandler, and now in the British Museum, which described the repairs and additions required to complete the building in the year 409 B.C. These, with other passages from different authors, he contended were all in favour of his views. He then pointed out the various indications which showed that buildings, certainly forming parts of the original design, once existed on the spot. This explained the existence of the two doorways under the northern portico, and the anomalous position of the central doorway in the western wall of the temple under one of the attached columns. Reverting to the interior, the lecturer explained, from existing indications, that the Temple of Minerva was divided into a pronaos and adytum by a screen of columns which were an exact repetition of the western façade of the Temple, omitting only the solid parts, but retaining the pillars and piers. Mr. Fergusson then explained the position of the Tomb of Erechtheus in a chamber under the floor of the Temple bearing his name, and that of the Tomb of Cecrops, as opposite the Portico of the Virgins, but separate from the temple itself. The position of the tree in the Pandroseum and of the well of salt water in the Temple of Minerva were also pointed out and illustrated by diagrams on the walls. In conclusion, Mr. Fergusson said he had looked up every passage which occurred in the writings of ancient authors in reference to the subject of his paper, but he did not find one which in the smallest degree militated against the theory he had advanced, or which was not equally inexplicable with the theory of the Pandroseum being in the centre. Similarly, he had examined every stone of the remains, and did not find one whose use could not be clearly accounted for on his theory. To sum up, the author pointed out the relative positions, in plan, of the three temples which were included in the group known as the Erechtheum, viz., that of Minerva Polias in the centre, that of Erechtheus to the eastward, and that of Pandrosos attached externally to the present building on the westward.

In the discussion which followed,

Professor Donaldson said it was half a century since he studied the Erechtheum on the spot, with the exception of a flying visit made a few years ago, when he was only able to cursorily glance at it. On his first visit he had particularly studied the doorway, with its magnificent tetrastyle portico, and had published drawings of it. At the time of his visit the ground was much encumbered with rubbish, and it was extremely difficult to tell where the transverse walls came across. But, *ex pede Herculem*, Mr. Fergusson, from a small plan had advanced a theory which was very ingenious, and his imagination had lent a great deal of reality to what did not exist at all. Mr. Fergusson was greatly to be thanked for his effort to explain what had always appeared to be an enigma. It was certainly a very remarkable thing that the ancients should have chosen such a difficult and awkward site. He (the speaker) thought the building itself was in a debased style of art, but very elaborately worked out. It appeared to be of a later period than the date assigned by Mr. Fergusson, although the inscription left no doubt on that point. Mr. Fergusson's theory was a most ingenious mode of describing the temple, and he (Professor Donaldson) begged to propose a hearty vote of thanks to the author of the paper.

Mr. F. C. Penrose said he was unable to contribute much to the discussion, for when he visited the buildings on the Acropolis at Athens, thirty years since, he had very little time to study the Erechtheum, as he principally devoted his attention to the Parthenon and the Doric temples. He had always recognised the difficulty of explaining the disposition of the buildings of the Erechtheum on the theories hitherto advanced, and had often longed to take up the subject, a course from which he had been deterred owing to inability to devote sufficient time to it, for it was a subject which required deep research and long and patient investigation. The limited amount of attention he had been able to give to the matter, however, inclined him to accept Mr. Fergusson's theory. He begged to second the vote of thanks.

Professor T. Hayter Lewis said that, like the previous speakers, he had to look back a great many years to the period when he visited the Erechtheum. At that time he made very careful notes and drawings, which he found of great use even in the present day. The importance of taking careful notes and measurements was evidenced by the fact that he found the drawings of Inwood and Stuart, which he had with him, to be very incorrect in several essential particulars. Mr. Fergusson's restoration was extremely ingenious, but exception might be taken to one or two points. In the Temple of Minerva Polias Mr. Fergusson had shown a level floor; but anybody with a critical eye would see that he must be wrong, because he took no account of the gaps shown on the plan, which, however, were not intended to be seen, being probably covered with slabs of marble. He thought that the large and, on plan, ungainly and unpicturesque portico would never have been constructed unless with the express object pointed out by Mr. Fergusson, of whose theory it was a strong corroboration.

Mr. Watkiss Lloyd thought that Mr. Fergusson's paper furnished an excellent illustration of the manner in which a good interpreter of a monument might sometimes correct a very good Greek scholar. Before coming to the meeting, he (the speaker) had the curiosity to turn to the account of the Erechtheum given by Ottfried Müller, the learned German archæologist, who, however, propounded a theory about the building which was entirely demolished by Mr. Fergusson. Ottfried Müller placed the Pandroseum in the portico, but Pausanias distinctly spoke of the naos of the Pandrosos. The naos was in reality a house, not a portico; in the inscription it was not called a naos at all. Had Müller paid a little more attention to his text he might possibly have anticipated Mr. Fergusson. It was now perfectly clear that the Pandroseum was another building, and scholars and architects alike were deeply indebted to Mr. Fergusson for the almost more than ingenuity of his solution of the problem. The Erechtheum was a building exceptional and anomalous in character, with its different levels and peculiarities of building, and afforded, moreover, some faint indication of how much of Greek architecture had been unhappily lost; for when it was seen how much variety could be introduced into such a building, it might be taken as a proof that the Greeks showed equal variety and power in adjusting their architecture to utility and circumstances.

Mr. Edward Hall remarked that there were some peculiarities in the plan of the temple as restored by Mr. Fergusson which were decidedly of late date. For example, the pilasters on the internal face of the western wall were Roman in character rather than Greek. The apsis was also a Roman feature, and might probably be omitted with advantage when the plan was published.

Mr. Leighton observed that he had seen the Erechtheum, and, speaking as a sculptor, had been much struck with Mr. Fergusson's elucidation of the building. The first point which impressed him (the speaker) when he saw the temple on the exterior was its columnar dignity, which completely effaced any unpleasant feeling which would be engendered by seeing female figures performing an architectural function by supporting an entablature or other heavy architectural member. On closer approach, the beholder was struck with the great variety seen in the figures themselves, not merely in the arrangement of the hair and in the folds of the drapery, but in the general pose of the figures, which evidenced the skill of the sculptor. Than these figures nothing could be more Greek, and nothing so little English, in character.

Mr. Burges said Mr. Fergusson's theory was a very bold one, and almost took away one's breath so that it could not be adequately discussed then and there. He suggested that the paper should be printed, and further discussed in a month or six weeks' time. Mr. Fergusson had confined himself almost entirely to the plan of the temple; he had told the meeting little or nothing as to its architecture, although it was the most beautiful building on the Acropolis. He therefore hoped Mr. Fergusson would favour the Institute with a paper on the architecture of the temple, which would be infinitely more interesting to architects than to know exactly whereabouts the Pandroseum stood. Architects wanted art, and needed to improve their art by means of Greek art. Architects needed to take up thirteenth-century architecture,—which was Greek architecture with the pointed arch,—and study it in conjunction with the best Greek examples. It was impossible to have good architecture until all architects were artists, which they were not at present.

After a few words from Mr. Wood and Mr. Arthur Cates,

Mr. Phené Spiers suggested that the subject might be taken up by the Conference of Architects, which is to meet in June next. Mr. Fergusson's paper was one of the most important that had been read before the Institute, and was deserving of more than passing notice. On the occasion of the last Conference, two years ago, the committee of the section devoted to architectural art was rather at a loss for subject-matter, and had to take up "Queen Anne" as the only topic which offered itself. Possibly Mr. Fergusson would, by the time the Conference met, be able to say a great deal as to the architecture and decoration of the Erechtheum.

Mr. Fergusson said he had very little to say in reply to the discussion, as there had been tolerable unanimity in favour of the views he had advanced. His object had been to show the position of the Pandroseum,—to settle the plan first. The architecture could not be explained so long as it was necessary to put the three buildings into two. This initial difficulty settled, it was possible to proceed to consider the architecture. He should be very glad to read a supplemental paper on this part of the subject; but there was the difficulty that it would require a large number of drawings in illustration of it.

The vote of thanks was then put to the meeting, and carried by acclamation.

The President said he thought the evidence brought by Mr. Fergusson to show that the Pandroseum was to the west of the better known temple was conclusive. Presuming that the discussion would go on, as he hoped it would, he thought that the difficulty as to drawings might be got over in this way: all members who had sketches or means of obtaining sketches of details of the Erechtheum could place them at Mr. Fergusson's disposal, and the result would be not only an additional and valuable contribution to the Institute's transactions by Mr. Fergusson, but a collection of drawings such as was seldom brought together in illustration of a paper. It was a very curious thing that a building so elaborated in detail as the Erechtheum should be of the same date, within twenty or thirty years, as the Parthenon.

The proceedings then terminated. The next ordinary general meeting of the Institute will be held on Monday, the 28th inst., when Mr. R. F. Chisholm will read a paper "On the Palace of Tiroomal Naik, Madras."

"ARTISTIC PAINTED GLASS" AT THE BURLINGTON CLUB.

THE title we have placed between commas is adopted by the Marquis d'Azeglio, the proprietor of the small but very curious collection of works so described now arranged in the house of the Burlington Art Club, as a distinctive description of a class of objects which differ essentially from what is generally known as "stained glass." Of the nature of the work, and the origin of the present collection, we may let the owner of it speak in his own words, quoted from the descriptive catalogue supplied by him at the request of the committee:—

"In 1865, in a small curiosity-shop in Milan, I came across the first of these glasses. It forms part of the tray No. 9; a large circular rock crystal lens, with a 'Descent from the Cross' in a grand style, and, underneath, the arms of the Venier family of Venice. I thought it very beautiful; but after carefully examining it, I could not make out what it was. It looked like a sort of enamel. At all events, I secured it for a moderate price. Singularly enough, this my first *trouvaille* I still consider as one of the gems of my collection. Soon after my return to

London, young Mr. Farrer, of Bond-street, wrote to say that he wanted to show me an exquisite object of art. It was the companion to the one above mentioned, 'Christ in the Garden of Olives.' . . . . Subsequently, having met with a few more, it struck me that perhaps here was a forgotten branch of art worth illustrating, and thus I gathered this collection all over Europe."

Of the specimens thus collected, by far the larger proportion are Italian, dating from 1350 up to a modern period, the most beautiful and interesting being those dating from 1500 to 1600. The specimens earlier than that period are mostly *sgraffiti* done in gold laid on glass, and shaded in line after the manner of engraving, the gold being removed for the lines and shadows. It is during the sixteenth century that there are found the small paintings having very much the appearance of enamel work, and mostly set beneath crystals, to which the two specimens already alluded to belong, and of which other examples are shown in the same tray. The two sacred subjects mentioned quite bear out the opinion of their artistic merit and interest expressed in the above quotation; the figures and countenances are fine in drawing and conception; the nude portions of the figures are of a greyish tint; the background or landscape is partly formed in gold *sgraffito*, and partly filled in with other tints. The mode of execution it is certainly not easy to understand, and perhaps this could hardly be very well ascertained without risk of spoiling the work in the process of investigation. Two small portrait lockets in this tray, beneath crystals which take the form of a heart-shaped leaf (or what would be a heart but that the point is curved to one side), are very charming specimens of fanciful ornament. An "Adoration of the Magi," in the centre of the same tray, appears to belong to the same set as the two other scenes from the New Testament history, and perhaps to be the work of the same hand. It is very delicately executed. Tray 7 contains a very fine little composition of the Crucifixion, labelled by the exhibitor, "School of Mantegna," in which the treatment is more decidedly conventional and ornamental, the figures having gold hair, &c.; but the design is of a very grand type, though on so minute a scale. The same tray contains a figure of the Madonna, executed in gold *sgraffito* on a ground of dark and unevenly tinted crimson glass. In the case at the end of the room are to be seen some large specimens of this etching in gold, as it may be called, in one or two of which the gold etching is used only for the drapery, and the limbs are coloured (in enamel?); but these, we fancy, belong to a later date. One specimen, a kind of flat dish, entirely in gold sgraffito, and evidently belonging to the period prior to the sixteenth century, is curious enough as a specimen of the refined grotesque, as one may call it, of Italian revived Paganism. It represents a collection of river deities apparently,—one with the head and body of a swan, on human legs, comes out of the water; other almost equally strange biformed figures recline on the bank; trees sprout from the top of shrivelled-looking female forms, &c. The thing is a curiosity, as a specimen of the artistic fancy of the time.

Subsequently in order of time to the paintings under crystal, which form the centre point, historically and artistically, of the collection, comes a third and very inferior form of painting on glass, consisting of coloured copies from engravings mechanically transferred; the original engravings from which one or two of the specimens are copied hang on the walls. These are coarse in execution, and, moreover, have perished very much in some cases; their artistic value is *nil*; but they serve as specimens to complete the historic illustration of the particular art in its decline. This, however, is followed again by another style, in which copies of this kind are carried out with a richer and more conventionalised ornamental effect, as illustrated by some very elaborate specimens in trays 12 and 13; but these have not the artistic feeling of the sixteenth-century and earlier work.

Among curiosities in the collection a figure of "Fame" (tray No. 7) may be mentioned, engraved with a diamond on the under side of the glass; a fault in the surface of the glass has been made to do duty as the sun, "rays" being made to diverge from it. An early specimen of German painted glass, "The Death of the Virgin," which belonged to Baron Marochetti, is most interesting, both in regard to richness of colour and (in its way) intensity of expression. A curiosity of another kind is a glass painting, labelled "*Copia Cinese di pittura Europea*," a Chinese copy or imitation of European painting. The subject is Europa taking her seat on the back of the kneeling bull, Europa being a pretty Chinese maiden, assisted by others, all in the costume of the country. The anomaly and confusion of associations are odd enough.

Some fine engravings hang round the room; some well known, by Marc Antonio and Dürer; others less known; and some interesting and very delicately-executed *nielli*, or designs left in white on a black ground. The collection of glass will quite repay a visit from its unusual, indeed, we may say unique, character. Admission is readily to be obtained through members.

We may mention that the club intend to make a collection next month of drawings and designs by Blake. Those who appreciate the peculiar power of that remarkable genius ought to look forward with interest to such an opportunity.

CAPTAIN LIERNUR'S SYSTEM OF SEWERAGE.

In accordance with instructions from the City Commissioners of Sewage, Mr. William Haywood, their engineer, has investigated Capt. Liernur's pneumatic system of sewerage, has conferred with that gentleman personally, visited Amsterdam and Leyden, where the system has been partially applied, and presented a careful and valuable report on the subject. Mr. Haywood sees the objections which may be taken to the system, as well as the advantages it possesses, and in conclusion says:—

"That the pneumatic system is not perfect on all points is certain, but its value must be considered by the side of the results of the existing system, with which it seems to me there is a growing dissatisfaction, and, as to its sanitary value, many doubts; and for that reason it seems to me important that the pneumatic system should have a full and fair trial in England."

He thinks it would be best tried in a poor district, where, the population being usually more dense, more excreta is produced from a given area, and where the consumption of water being less, and the condition of the ordinary syphon-pans more resembling that of the pans under the Liernur's system, water supply might be omitted or withdrawn from the closets without objection from the inhabitants. In the metropolis, and in most of our great towns, under the Artisans' Dwellings Improvement Act, large numbers of dwellings for the working classes are likely to be built, and there the system could be tried under favourable conditions; in the suburbs of London whole districts are also being laid out for the residences of those in very moderate circumstances, and there a similar opportunity offers itself.

LINE OF FRONT.

At the Westminster Police Court, Mr. Arnold, as already mentioned, has given judgment in a case in which Mr. Charles Lahee, the Vestry Clerk of St. Luke, Chelsea, was the complainant, against Messrs. Adamson & Sons, the builders, of Putney, for an infringement of the Building Acts at Sloane-street, Chelsea.

Mr. Arnold said: This is a summons taken out by the Vestry Clerk of Chelsea, alleging that the defendants "were the builders of a certain erection, to wit, certain bay windows of the house No. 142, Sloane-street, erected beyond the general line of building in such street, without the consent in writing of the Metropolitan Board of Works, the distance of such line of buildings from the highway not exceeding 50 ft." The proceeding is instituted under the 75th section of the Metropolis Local Management Act of 1862 (25 and 26 Vic., cap. 102).

The facts of the case which are not in dispute are as follow:—At the beginning of last year the defendants pulled down an old house, the shop frontage of which extended 9 ft. 6 in. beyond the general line of buildings "as decided by the superintending architect to the Metropolitan Board of Works." At the end of July or the beginning of August they began to build a new house as a dwelling-house on the site of the old one, putting back the general frontage of the house to the general line, but erecting bay windows in the centre of the house to the ground and first stories, which windows project 3 ft. beyond the general line.

It was contended on behalf of the defendants that the building comes within the provisions of the seventy-fourth section, "in case any building situated within any of the parishes, districts, or places comprised in the schedule of the firstly-recited Act, which shall in any part thereof project beyond the general line of the street in which the same may be situate, or beyond the front of the building, wall, or railing on either side thereof, shall at any time be taken down to an extent exceeding one-half of such building, such half to be measured in cubic feet, or shall be destroyed by fire or other casualty, or demolished, pulled down, or removed from any other cause to the extent aforesaid, it shall be lawful for the Metropolitan Board of Works to require the same to be set back to such a line, and in such a manner, for the improvement of any street as the said Board shall direct; provided that the said Board shall make compensation to the owner of such building for any damages and expenses he may sustain and incur thereby."

The Metropolitan Board of Works had not required the building to be set back under the last-mentioned section, nor had they consented to the erection of the bay windows beyond the general line of buildings under the 75th section.

On behalf of the complainant, however, it was contended that Sections 74, 75, and 76 should be read together, and that as the defendants had not obtained the consent of the Board of Works, the Vestry were entitled to an order for the demolition of the projection in question.

It was not stated in what way Sections 74 and 75 were to be read together (for Section 76 has really no bearing on the present question), but I suppose it was intended to be argued that when an old building projecting beyond the general line had been taken down, and the builder proposed to erect a new structure on the old foundations, *i.e.*, also projecting beyond the general line, he was in the first instance to apply, under the 75th section, for the consent in writing of the Metropolitan Board of Works to such projection, and that if the Board did not consent, they were, under the 74th section, to require the building to be set back to the general line, and to make compensation to the owner, and then if the building was continued beyond the general line, the Vestry or the District Board of Works would revert to the 75th section, and be entitled to a justice's order to demolish the projection.

But I am clearly of opinion that this is not the meaning of the statute, and that it would be a confusion and jumbling together of enactments that are applicable to different sets of circumstances.

The 75th section applies to the case either of a new building, or of the removal of an old one where the builder wishes to have a projection beyond the general line which had not existed before; in either of these cases the builder, having no previously-acquired rights, is to take the initiative and obtain the consent of the Metropolitan Board of Works before he can lawfully erect the proposed projection.

The 74th section, on the other hand, applies expressly to a case like the present, where an old building which did project beyond the general line is taken down and a new building is erected in a projection to the same or a less extent than the old one (for it can make no difference in principle if—as in the present case—the projection does not extend so far as the old one had done). In such a case the owner is exercising his existing rights, and if, on grounds of public convenience, or for any other reason, the Metropolitan Board of Works should be of opinion that the frontage should not extend beyond the general line, it is for them to take the initiative, and to require the owner to set back the frontage to the general line, and to pay him compensation for any damage and expenses he may sustain.

I need not refer to the seemingly unnecessary delay that has taken place between the original commencement of the works and the issuing of the summons, as that fact does not touch the merits of the case; but I am of opinion that the owner of the house in question had a right to rebuild the house upon or within the old foundations, unless required by the Metropolitan Board of Works to set it back; and that neither he nor the defendant (the builder) was called upon to obtain the previous consent of the Board for that purpose. The summons, therefore, will be dismissed.

Mr. Corsellis, for the defendant, asked for costs, and 2*l.* 2*s.* was allowed.

Upon the application of Mr. Wallace, barrister, for the Vestry, a case was granted for a superior court.

It is to be hoped the Board of Works will not waste any more money in endeavouring to sustain an obviously erroneous opinion.

RUINOUS BUILDINGS AND THE BUILDING ACT.

On the 10th inst., an adjourned summons, of a protracted nature was heard at the Guildhall, before Sir Andrew Lusk, M.P., with regard to the dangerous state of the back walls of Nos. 69 & 71, Coleman-street, City. Mr. A. J. Baylis appeared on behalf of the Commissioners of Sewers; and Messrs. Lumley and Dowling for the owners and occupiers.

Mr. Edmund Woodthorpe, District Surveyor of the Northern Division of the City of London, was called, and stated his opinion as to the walls in question; and his views were supported by Mr. Tabberer, District Surveyor for Greenwich, Mr. Hammond (a qualified District Surveyor), and by a highly respectable builder.

For the defence it was contended that although the walls were old and bulged, and the floors settled, yet there was no danger, in support of which contention Mr. Chatfeild Clarke, Mr. Reed, Mr. Joy, and another surveyor, were called.

Sir Andrew Lusk considered the weight of evidence was against the Commissioners of Sewers, and declined to make an order for the demolition of the walls.

The solicitors for the defence made an urgent appeal for costs, but Mr. Martin, the chief clerk, stated that the magistrate had no power to allow them.

The City Architect's Salary.—At a meeting of the Court of Common Council, on the 10th inst., the Lord Mayor laid before the Court a letter of Mr. Horace Jones, the City Architect, soliciting a reconsideration of his salary. The communication gave rise to much argument, in the course of which it was stated that the architect had a salary of 1,500*l.* a year, and that only two years ago, in consideration of his eminent services, he received a bonus of 5,000*l.* Mr. L. H. Phillips moved that the letter should lie upon the table. On the other hand, Mr. Deputy Lowman Taylor and other members paid a high tribute to the ability and eminence of the City Architect. In the result the letter was referred for consideration to the Officers and Clerks Committee.

ARUNDEL CASTLE.

ARUNDEL, in its position, magnitude, and history, is one of the foremost of the Mediæval military structures of England. English probably in its origin, Norman certainly by adoption, it is not only among the rare castles recorded in Domesday, but is the only one therein specifically mentioned as in existence before the coming in of Duke William. It was held by Alfred and by Harold, and was granted with its surrounding and dependent lordships by William to the head of the great house of Montgomery as an acknowledgment of kinship, and a fitting reward for his distinguished services at Hastings. Three members and two generations of that family held the castle for about thirty-two years. They were followed by Henry I. and his Queen, who held it for half a century, and it has since descended in blood through the lines of D'Albini, Fitz-Alan, and Howard, through seven centuries of inheritance, to its present lord. Though less extensive in area, it is equal to Windsor in antiquity and position, and resembles it closely in type, having an upper and lower ward, and a lofty mound partially interposed between the two, girdled by a deep fosse and crowned by a circular keep. Within its precinct is the Chapel of St. George, and far beyond the walls, but in one direction only, extends its broad demesne. It has also its own peculiarities. Just beyond the wall of the Norman castle, but probably within the earlier English outwork, stands the fine parish church, a Fitz-Alan gift, and attached to its east end is the chapel of the college founded by Richard, Earl of Arundel, in 1386, and now, by a grant or purchase in the reign of Edward VI., vested in the descendants of its founder, and the private property of the lord of the castle. The buildings of the college are mostly removed, and the chapel, though still standing, is in a dilapidated state, and closed against visitors. This is much to be regretted, as it contains many tombs of great magnificence and considerable historic interest, beneath which rest the remains of many members of the great house of Fitz-Alan, who loved full well and gave full largely to that church to which their Howard descendant has shown himself a not less liberal benefactor.

The Arun, a principal river of the south, has its sources in Surrey. It traverses the whole breadth, here about twenty miles, of the county of Sussex, and in its passage to the sea cleaves the southern ridge of the chalk by a very striking ravine or dell, which, with the river, gives name to the castle and the town, as well as to the Rape of Arundel, within which they stand. The castle is placed upon a bold bluff of chalk, which rises on the right or western bank of the river, here flowing in easy curves across a broad tract of low and level land, which intervenes between the downs and the sea, from which the castle is distant about four miles. Upon and at the foot of the slope has sprung up the town, which for centuries paid allegiance to the castle and received from it protection and support. Six miles westward of the Arun is Bognor, rich in Roman remains, and as far to the east is the mouth of the Adur, where Shoreham contests with Portsmouth the representation of the ancient Portus Adurni. A few miles north of the castle Stane-way marks the line of the old Roman road between Chichester and London. Various villages, the names of which show their English origin, are thickly posted along the lower course of the Arun; but the name of the river and of its tributary the Rother, may be British, as are no doubt the hill camps here and there scattered over the downs. The Rape is supposed to be a Jutish division. It includes five Hundreds, and was formerly nearly all forest. The courts were held beneath an oak-tree at Madehurst.

The bluff occupied by the castle is the end of a ridge of high ground, which is specially steep towards the east and south, and ascends to still higher land towards the north and west. In this direction lies the park, which covers about 1,100 acres, and includes, between two ridges of the chalk, a deep combe or valley, in the lower part of which, just below the castle, is the lake called Swanbourne, the pool from a very remote period for the use of the mill.

The history of Arundel has been written by Dallaway in his Western Sussex, and by Tierney in a specific work. Whatever may be the value of either production for the history and descent of the lordship, neither gives a full plan of the earthworks of the castle, nor enters at all scientifically into its details from either the military or architectural point of view. Unfortunately, the proximity of the castle to Brighton and some lesser watering-places has caused the exclusion of visitors, save under restrictions so very narrow that it is impracticable to examine the works at all in detail. It appears from Tierney's history that the castle is protected towards the north or open country by a double line of defence, composed of a bank and ditch, of which the outer includes the present as well as the older park, and is, in places, at least two miles from the castle. The inner is of much smaller extent, but the two seem intended to protect the town and the port, as well as the site of the castle, and to be rather lines of defence than the remains of a camp, whether British or English. Within both these, and probably of later date, are the earthworks upon a part of which the Norman castle was founded. These resemble the works common to England with Normandy, and may probably be attributed to the Northern invaders in the eighth or ninth centuries. The high ground is occupied by an oblong inclosure, of which more or less of the original earth-bank remains, and outside of which to the south and east was the natural steep, and to the west a natural hollow, deepened and extended round the north front by art. The inclosure is in length 317 yards, and in breadth 83 yards, and includes about 5½ acres. Near the centre of the western side, and forming a part of the *enceinte*, is a large circular mound, almost wholly artificial, having its proper ditch, which on the outer face is also the ditch of the general *enceinte*. The mound is about 90 ft. diameter at its table summit, and about 230 ft. at its base. As the ground rises towards the north, the height is on that side about 50 ft., and on the opposite side about 70 ft., from the bottom of the ditch. The Windsor mound is about the same height, but rather larger, being 125 ft. across at its summit. By its projection this work materially narrows the main area, and with the addition of a short cross ditch, bank, and wall, now gone, divided it into an upper or northern and lower or southern ward, in the latter of which are the domestic buildings. These two wards were the parts of the earlier fortification taken possession of by the builder of the Norman castle, but there is also an inclosure opposite to the mound, and outside the ditch, which runs up to a narrow end towards the north-west. Whether this was fortified with masonry is uncertain, but it certainly was a part of the earlier fortress, and shows its extent and importance. The ditches everywhere being in the chalk, and at a high level, were no doubt always dry. Earl Roger, probably, found along the crest of these earthbanks the same sort of defences that he left behind him, on similar banks and mounds, at his paternal castle in Normandy, but whether these were of timber or of masonry is uncertain. They might very well have been of either. It is, however, certain that the earl, or his immediate successors, inclosed the main area within a curtain of masonry, which ran up the mound and placed half of it, as at Lincoln and Tonbridge, outside the inclosure. Upon this curtain, a little south of the mound, was placed the gate-house, and along it at various points were mural towers, probably square, of which one, on the curtain north of the mound, and known as Bevis Tower, still remains, though more or less altered. The domestic buildings were then, as now, along the sides of the lower ward, and upon the mound was placed a shell keep.

As the public are only permitted to inspect the lower part of the gate-house, the adjacent curtain, and the interior of the keep, it is impossible to form a correct opinion as to the extent of the original earthworks, or as to the age of the general curtain, or the basement of the domestic buildings, parts of which are said to be of Norman date. That the earthworks were extensive, and in part remain, may be seen from the summit of the keep, and from the upper gate of the park. Dallaway gives a large, but not quite correct, plan of the keep and its mound, the gate-house and Bevis Tower, and the lower ward; but his plan does not include the higher ward nor the earthworks, nor is it accompanied by any sections. Neither he nor Tierney were strong in architectural details.

The *Gate-house* stands on the line of the curtain, projecting inwards from it, and upon the southern edge or counterscarp of the ditch of the mound. It opens into the lower ward. It is of the early Norman type, resembling that at Tickhill. It is a square of 32 ft., having in the outer and inner faces a large round-headed doorway, quite plain, without even a chamfer, and with a plain sloped abacus. The chamber is, of course, square, and but little broader than the doorways. That towards the ward seems to have been closed by a pair of doors only. The other or outer doorway has a broad portcullis groove, which may or may not be original; more probably not. The covering—the floor of the upper room—was no doubt of timber, and flat. The present vaulting is an insertion. There was always an upper floor, but this has been much altered, chiefly in the Decorated period. The old loops, now blocked, may be traced. Some of the inserted windows are very late. In the south part of the inner doorway was a door opening into a mural stair leading to the upper floor and to the rampart-walk of the curtain, which seems to have been continued through the gate-house, over the outer portal. The present staircase is exterior, and modern. This is the whole of the original gate-house, which, with the adjacent and very thick curtain, is probably the work of Earl Roger.

The gate-house has been produced outwardly in the Decorated period. There is appended to it a crooked passage about 10 ft. broad and 40 ft. long, between thick lateral walls. In its sides are shoulder-headed doorways, which led into lodges and cells, and on the south side is a well-staircase, ascending to the roof. The passage is covered by a very flat-pointed vault. It ends in an outer doorway having a drop arch, and opening between a pair of flanking towers, 20 ft. square, rising out of the ditch. These have sub-basement chambers in the ditch, basements at the ground level, and two upper floors. In the doorway is a very broad portcullis groove for a timber frame, and in front was a drawbridge, now replaced by an arch of masonry. This addition to the Norman gatehouse, making with it a very long covered entrance-passage, is attributed to Earl Richard Fitz-Alan, on his return from the wars of Edward I. In very modern times the floor of the passage has been lowered about 3 ft., and the walls underpinned by a plinth. The doors, which are not in use, have been left unaltered, and show the original level of the sill. Probably the approach to this entrance lay through an outer gate to the north-west, at the upper part of the town, and across the large outwork, now a garden and a carpenter's yard.

The *Keep* is a rounded shell of masonry, about 67 ft. by 59 ft. in the internal cross diameter, and with walls, 8 ft. to 10 ft. thick, and 20 ft. high to the rampart walk. It is built of rubble masonry, the material chiefly Sussex stone and chalk, but faced outside with small ashlar blocks of Caen stone, close jointed, and with flat pilasters which die into the wall below the base of the parapet. The entrance was by a rather large full-centred doorway to the south-east, probably reached, as at Tickhill, by a flight of steps up the mound, with a timber bridge at their base, as at York. This doorway is not shown to visitors, but Tierney's drawing represents it as having a bold chevron moulding alternating with rolls or rounds, common to the head and the jambs, and unbroken by imposts. Within, it opened into a recess, also full-centred, and having its angle replaced by a bold roll. This, as at Lincoln, was the original entrance, and it seems, though walled up, not to have been otherwise altered. Near this doorway a well-stair has been formed in the wall, ascending from the ground to the ramparts. It is evidently a Decorated insertion, of the same date, with a steep flight of steps and a vaulted subterraneous chamber near the centre of the area, and which seems to have been a cellar belonging to the lodgings which, as at Windsor, were at one time built against the wall all round, leaving a small open court, as at Tamworth and Ledes, in the centre. That there were here such lodgings is evident from the roof corbels in the wall, and that they, as at York, had an upper floor, is shown by a late fireplace, which marks the upper level, and the back of which is formed of tiles set on edge. The parapet was about 8 ft. high, and crenellated, and in each merlon was a loop, set in an arched recess. In one merlon is a small full-centred recess, evidently a garderobe. The present parapet seems a Decorated addition. The keep stands, as does the mound, on the line of the main curtain, which crosses the ditch from the gatehouse, and ascends the mound, and has a similar continuation northwards. Where the south curtain abuts upon the keep, there stands a broad irregular tower, of about 20 ft. in projection by 50 ft. in breadth. This contains the well and its chamber, the entrance from the curtain rampart, and an oratory. The entrance is by a vaulted passage, with a portcullis groove

at the ground level of the keep. The curtain has a parapet on either face, forming a close way, and is commanded by a sort of balcony connected with the keep. The well is of unusually large diameter, but not in use. The chamber was at the ground level of the keep, into which it opened by a full-centred doorway. There was also an upper chamber, now ruined. This position of the well, on the outside of the keep, is found elsewhere. At Wallingford it is on the slope, and at Cardiff nearly at the foot of it. The oratory, or chapel of St. Martin, is a small chamber of irregular plan at the first-floor level, and is placed over the entrance passage. It has a large east window, altered at two periods, and two smaller lateral windows, all now closed up. The roof was of timber, and is gone. This oratory had a special endowment, afterwards shifted and expanded in favour of the large chapel in the lower ward. The details of this appendage show that, as at York and Cardiff, it was an addition to the original shell, the ashlar face of which is seen within one of the lower chambers. At Cardiff the added tower was Perpendicular; at York, where it included a small chapel, Early English. Here the addition seems Early Decorated. The chapel is probably the St. Martin's mentioned in Domesday, and in the Patent Rolls of 1275, and was, of course, dismantled when the endowment was shifted in 1375. The keep is mentioned at different periods as Beaumont, Hautmont, and Grosmont, all names preserving its chief characteristic.

As the English "Aula" was probably on this mound, while the ashlar exterior of its present wall is unquestionably later than the Conquest, it has been supposed that the heart of the wall is original, and that it was cased by the Norman architect. Of such casing there is, however, no appearance. The entrance from the curtain is cited to show early masonry, it having probably been cut through the wall, some of the stones of which are laid in horizontal courses, rather than as regular voussoirs. This irregularity, however, does not warrant the interpretation placed upon it. The wall appears all of one date, and that probably late Norman, as is usual with shell keeps.

Bevis Tower stands upon the curtain, and projects from its outer face only. It stands on the north counterscarp of the ditch of the mound, about 42 yards from the keep. It is square, and said to be, in substance, of the age of the gatehouse, but it is not allowed to be seen close. It is called a Barbican, but its position scarcely justifies its having been so intended. It looks more like an ordinary mural tower. There is no communication from the keep with the curtain on this side. North of this tower the earthworks of the upper ward seem tolerably perfect, but a proposition to be allowed to visit them was evidently regarded as a sort of sacrilege.

Besides the well attached to the keep was a second, now covered up, in the middle of the lower ward. The habitable part of the castle is mostly or entirely Howard work. Edward, the ninth duke, was a great builder. He rebuilt Worksop, which was burned soon afterwards, in 1761, and he founded Norfolk House in St. James's-square. What he did here does not appear. The present domestic buildings which line the lower ward to the east, south, and west sides are, in substance, the work of Duke Charles towards the close of the last century, or 1791—1806, and have since been added to. They are what might be expected from the period, and better than the rather earlier work at Alnwick, lately removed. It is said that in the cellars, and built into the outer walls, are parts of the earlier structure, some of Norman date. The hall stood on the east curtain. It had a good Early English door, destroyed in the present century. The hall itself was ruined during the siege of 1643. The present grand entrance to the ward, to the south of the original one, is entirely modern, as are the approach to it and the outer gateway. So also is the Chapel of St. George, which stands along the west wall. The chapel which preceded it, and was taken down in 1796, was 40 ft. long by 22 ft. broad, and was endowed by Richard, Earl of Arundel, in 1375, with spoils derived from Crecy. The domestic buildings are said to have been augmented at the same time by wealth from the same source. The ecclesiastical endowment, shifted from the oratory of St. Martin to the Chapel of St. George in 1375, was, after about a century, again shifted to the Fitz-Alan Collegiate Church, without the walls.

Arundel is a castle where, if anywhere, traces of English masonry earlier than the Norman Conquest might be expected to be preserved, and no doubt it is possible that such may be found about the foundations of the Norman walls. What is mainly remarkable about it is the resemblance to Windsor in its general plan; the oblong enclosure encroached upon from one side by the mound and its ditch, so as to divide it into two wards in one of which are domestic buildings. The older part of the gatehouse, and parts of the curtain near it, may be regarded as Early Norman, the work probably of Earl Roger. The keep seems later, though also Norman. The additions to the gate-house, the well tower, and the oratory are probably Decorated. What is wanted is a correct ground-plan, which should include the outworks and the more distant earthworks. The older walls should be critically examined, and especially the basement of the domestic buildings.

HISTORY.

The Manor of Arundel, with others in this immediate neighbourhood, was given by Alfred, by will (885) to his brother's son. It was held by Harold, and afterwards by William, who about or before 1070 granted to Roger de Montgomery the castle and honour of Arundel, with 84½ knights' fees. Roger, who was of kin to the Conqueror, and commanded the Norman centre at Hastings, became Earl of Arundel and Shrewsbury, and held the Castle about twenty-three years, till his death. Domesday describes the Castle of Harundel as having, in the time of King Edward, paid annually for the mill, 40s.; for three "conuvii," or entertainments, 20s.; and "pro uno pasticio," or pasty, 20s. There was also the church of St. Nicholas, or parish church, and St. Martin's, probably the chapel of the castle. There was also another mill which paid ten bushels of corn. The burgh, port, and shipping paid 12*l.* or more.

It is curious that Arundel, Chichester, Shrewsbury, and the Norman Manor, whence Roger derived his territorial designation, each possessed a mound, as also did the chief seat of the Welsh county, to which his son gave the family name. On William's death in 1088 Earl Roger gave his support to Robert Curthose, whom he invited to land at Arundel. The Prince's sluggishness alienated his English followers, and the Earl tendered his aid to Rufus. At Earl Roger's death, in 1094, he bequeathed his Sussex earldom, called also "of Chichester," to his younger son Hugh, the Hugh Goch of the Welsh, who held both Arundel and Shrewsbury, stood in opposition to William Rufus, and was slain while repelling pirates from the north Welsh coast in 1098. His successor in the English earldom was his elder brother, who already held the family lordships in Normandy. This was Robert, Earl of Belesme in la Perche, who received at Arundel William Rufus on his arrival from Normandy in 1097.

Earl Robert, the wicked son of a wicked mother, was a bold soldier, and an able, though a very cruel man. He built with great rapidity the strong castle of Brugge or Bridgenorth, and that of Montgomery, called by the Welsh Tre-faldwin, from Baldwin, its early seneschal. His career in England was violent and short. Bridgenorth was besieged and taken by Henry I., who brought the wooden turret known as a malvoisin to bear upon its walls. He went into exile in 1102, and died in 1118.

King Henry held Arundel till his death, when it passed in settlement to his widow, Adeliza, daughter of Godfrey of Louvaine, Duke of Brabant. The Queen Dowager married William d'Albini, a Norfolk noble, known to chroniclers as "William with the strong hand," the royal butler. They received the Empress Maud at Arundel on her landing in 1139, with her brother, the Earl of Gloucester, and in consequence had to stand an attack from Stephen, to whom, it is said, Adeliza pleaded with success the duties of hospitality, and Maud was allowed to retire to Bristol. D'Albini, however, was, on the whole, a supporter of Stephen, though with great judgment. He advised the accord between Stephen and Henry in 1153, and signed the compact as "Earl of Chichester." Henry, on his accession, acknowledged the service by a grant of the earldom of Arundel in fee with the third penny of the county of Sussex. Earl William died in 1176. By Adeliza, who died in 1151, he left a son, also William, the first of four generations of d'Albinis, and of five persons who held the earldom of Arundel, or as they called it, of Sussex. They were buried at Wymondham, their own foundation. Earl Hugh, the eighth from the Conquest, died childless in 1243. Isabel, his sister, carried on the succession, and married John Fitz-Alan, whose son, on his uncle's death, succeeded.

This John, head of the great house of Fitz-Alan, Lords of Clun and Oswaldestre, became the ninth earl, and died 1240. He was the first of fourteen earls of the name who held the castle for twelve generations. Of these the older line died out in the person of Thomas, fifteenth earl, who died childless in 1415; but the succession was continued by his cousin, Henry Fitz-Alan, Lord Maltravers, who died 1580, leaving an heiress, Mary, who married Thomas Howard Duke of Norfolk. The later Fitz-Alans lived much at Arundel, with which place they became closely identified.

Duchess Mary died 1557, and her husband in 1572. Their son, Philip, became twenty-second earl, since when there have been in all ten generations of Howards who have held the title of Arundel, the present Duke of Norfolk being the thirty-fifth Norman earl, and the thirty-second by descent from Queen Adeliza and William d'Albini.

The castle of Arundel has not played any very important part in English history. Its most famous event is the siege of 1643, when it was besieged by Sir William Waller, who first attacked and took the town, then defended by walls, and finally battered the castle from the tower of the church, where he posted his guns. The siege lasted from the 20th December, 1643, to the 6th of January following, when the place surrendered, and with it the celebrated Chillingworth, who died shortly after. The domestic buildings were then ruined, and seem so to have remained until the last century.

The town was walled round by Richard Fitz-Alan, who had a licence for that work in 1295. There were two gates, one below and on the river, the other called St. Mary's, at the top of the town. The town wall seems to have abutted upon the castle, which thus formed a part of its defence.

The present duke has built just outside the castle, and not far from the parish church, a large church dedicated to San Filippo Neri, a very noble structure, and fitted up with great simplicity and excellent taste. Unfortunately it is so placed as to detract materially from the general aspect of the castle from the plain below. Placed a little lower down it would have left the castle as the predominant figure, permitted the fine old parish church to hold its due place, and have supported and elevated instead of somewhat oppressing the whole group.

1876. G. T. C.

DOINGS IN SCOTLAND.

The Safety of Glasgow Bridge.—As the chief of several connecting-links between the north and south sides of the city, it is obviously of the greatest importance to maintain the Jamaica-street bridge, Glasgow, in a state of security, and especially as a vast and increasing traffic daily passes over at that point. It has long been feared by some persons that the gradual and natural deepening of the channel of the river underneath had rendered the bridge insecure, and that measures would have to be adopted for strengthening the structure. It is satisfactory to learn, however, that a report was presented at a recent meeting of the Glasgow Bridges Trust, by Messrs. D. & T. Stevenson and Messrs. Bell & Miller, the effect of which should serve to allay any feeling of grave anxiety on the score mentioned. The report says,—"We have examined the superstructure of the bridge, which presents no indication of settlement or dislocation; and having carefully considered the information afforded by the sections which have been made by our instructions, we have the satisfaction of reporting that, in our opinion, the foundations of the bridge are in no immediate danger, and that, unless considerable additional scouring or deepening were to take place, we think there need be no apprehension of damage to the superstructure. Although the channel of the river under the centre of the arches has been scoured to a greater depth than the masonry of the foundations of the piers, still the piers themselves are in all cases surrounded by material of a much harder character than the natural bed of the river, and these harder materials have not been affected to the same extent by the scouring action of the currents. This harder covering or protection round the several piers is probably due to the remains of the coffer-dams used in constructing the work having been left in the river's bed, and

to some extent also to the deposit of heavy materials as a further protection to the foundations. We are not prepared to say that it may not be found desirable to apply at certain places some means to insure the permanence of this coating of harder material by which the piers are surrounded; but there is, as already said, at present no scouring action to occasion any immediate apprehension for the safety of the bridge." The minutes of the committee, containing the report, were adopted. At the same meeting, while on the subject of bridge accommodation, Mr. Laing gave notice of the following motion,—"That having in view the increasing traffic of the city, especially in the vicinity of Argyle, Buchanan, and Jamaica streets, and the near completion of the City Union Railway-station at St. Enoch's square, the trustees should take into consideration the propriety of providing additional bridge accommodation between the north and south banks of the river, so as to prevent the dangerous overcrowding of the streets leading to the Glasgow Bridge, and that it be remitted to a special committee to consider and report."

Operations of the Glasgow Improvement Trust. The minutes of the general committee, read at a late meeting of the Glasgow Improvement Trust, embraced a lengthy report by Dr. Russell, medical officer of health, giving some interesting information on the immediate results of the operations of the Improvement Trust as regards the inhabitants of the lower quarters of the city displaced about May, 1875. Up to that time 818 families had been displaced, as against 351 displaced in May, 1874. Of these, 655 families, representing a population of 2,720, had been traced to their new homes. The area of demolition between May, 1874, and May, 1875, was chiefly the Gorbals and High-street. On inquiry by the medical officer as to the size of houses inhabited by the families displaced, it was found that there were, before the operations of the Improvement Trust, 55 per cent. of those families living in houses of one apartment, and after, 42 per cent.; before, 36 per cent. living in houses of two apartments, and after, 41 per cent.; before, 6 per cent. living in houses of three apartments, and after, 7 per cent.; before, 3 per cent. living in houses larger than three apartments, and after, 2 per cent.,—leaving a balance of 8 per cent. who betook themselves to lodgings, to the suburbs, and to the country. The report afterwards dealt with the rental of the old and new houses, the question of overcrowding, and the method of the disposal of the excreta. Bailie Morrison, in moving the approval of the minutes, gave an elaborate account of the work in progress, and the alterations contemplated by the Trust during the course of the summer. What was known as the Bell of the Brae Improvement was being rapidly carried forward, for it was intended to reduce the level of the High-street at that point by something like 16 ft. The alterations had caused them to encroach upon the prison, and they had been obliged to excavate a portion of the ground, and had undertaken the responsibility of rebuilding the prison wall, abutting on the Bell of the Brae. The ground at this point was very valuable, and they considered it due to the tastes of the inhabitants, as well as for their own interests as owners, to erect the wall of the prison in the Gothic style, somewhat like the entrance to a baronial residence or castle. Alluding to the large square in front of the infirmary and the cathedral, he said it was proposed that it should shortly be laid off, and describing the Barony Church of the late Rev. Norman Macleod as an "abortion," suggested its removal, when he was certain they would have a spot which, architecturally, would be the best in the city to which visitors could be taken. Alluding to a report by Dr. Russell on the lodging-houses, Bailie Morrison said remits had been made to various members of the committee to secure suitable sites for the erection of such houses. At the Cross and Greendyke-street very extensive premises of this kind would be ready for occupation at Whitsuntide. At Bridgeton Cross they had secured a large site, and plans were in course of preparation for a lodging-house there which would give ample accommodation to the poorer residents of the district. As to Gorbals, a very suitable site had been fixed upon in Portugal-street, and plans were in course of preparation. In Anderston an excellent association existed, having a model lodging-house, and the trustees had not done anything in that district. The basis upon which the trustees desired to have these lodging-houses was, that they should be self-supporting. The accommodation would be good, and after they were erected any man would be able to get, at a cheap rate, a clean bed, and have the benefit of proper cooking utensils, &c., so that the low class of lodging-houses would find it impossible to compete with the new ones. Alluding to another important subject, the most probable site for a free library, the bailie said a little consideration would enable them to come to a fair conclusion. If they bore in mind the intended widening of Bell-street and High-street each to 60 ft., the widening of Salt-market to 70 ft., the improvement of Gallowgate in its levels, the widening of Trongate to 100 ft., they would have an idea of the City Improvement Trustees' work. Instead of being what it now seemed, a chaotic system of demolition, they would find it a harmonious and grand whole, which would hand the name of their city architect down to posterity. There would be one splendid thoroughfare extending from Partick on the west to Camlachie on the east, the transition from Trongate to Gallowgate being almost imperceptible. All the glories of the past Cross of Glasgow would be revived, and there he held was the proper site for their central free library. That building would be part of the large architectural scheme of Mr. Carrick, which embraced the reconstruction of the site lying between Salt-market, King-street, Trongate, and Prince's-street. Entrance would be given to the library from each of the four streets, and it was proposed to line the corridors with pictures and statuary, and to make it ornamental to the eye. Having entered into further details of the scheme, the Bailie concluded by expressing his belief that this was the true problem of where the Mitchell bequest for the free library was to find its resting-place. The minutes of the trust, after some discussion, were approved.

The Warming of Public Buildings.—At a meeting of the Royal Scottish Society of Arts held in Edinburgh, Mr. T. B. McFadzen, architect, communicated a paper by Mr. Chas. J. Henderson, Royal-terrace, the subject being "On Warming Churches and other Public Buildings." Mr. Henderson suggests that the heated air be admitted near the roof, while, at the same time, the cold air be drawn from below by a door opening into the stove-room on the level of the floor. From the stove-room the heated air is carried up an undulating pipe to the ceiling, where an opening is made into the building, and thus the heated air escapes into it. The plan, it was stated, was now in operation in a church at Grahamstown, and it was found in this way that a circulation was established resulting in a very short time in the whole air in the church being raised to a uniform temperature, while affording complete means of control so as to discontinue the process when necessary. In the course of the discussion which followed, Dr. Stevenson Macadam objected that this method did not allow any means of escape for the vitiated air which would remain in the upper part of the building. Ultimately the matter was remitted to a committee to report. The principle involved has been often discussed.

THE TESTING AND STRENGTH OF MATERIALS.*

Wrought Iron.—The tensile strength of good wrought iron is nearly four times greater than that of cast, viz., twenty-four tons per sectional inch. Mr. Mallet gives twenty-three to twenty-four tons, and Mr. Kirkaldy twenty-five tons for bars, and twenty-two tons for plates. Mr. G. Berkeley gives as his experience of breaking-strength:—

	Average. Tons.	Minimum. Tons.	Average Stretch. In. In.
Plates	20 ...	19 ...	1 in 12 lineal = 8·33 p. c.
L and T...	22		1½ in 12 lineal = 10·5 p. c.
Rivet Iron.	18		

The Admiralty would seem to have a good opinion of Low Moor and Bowling iron, for in a late specification for boilers, they mention that all plates, with the exception of these, will be tested, and must be capable of standing the following tests:—Tensile strains per square inch, lengthways, 21 tons; crossways, 18 tons. Forge test (hot), plates to admit of being bent hot without fracture to the following angles: lengthways of the grain, 125°; across, 100°. Forge test (cold), plates to admit of being bent cold without fracture to the following strains:—

	⅞ in.	¾ in.	½ in.	⅜ in.
With the grain	20° ...	25° ...	35° ...	35°
Across the grain ...	5° ...	10° ...	15° ...	15°

Bridge Tests.—A piece of iron 2 in. wide and ½ in. thick, and of sufficient length to have 7 in. under actual tension, to be cut from any plate intended to be used on the work, and the following tensile strains applied, the plates of similar manufacture to be rejected if the extension of the piece tested is greater than ⅛ in. under 18 tons, ¼ in. under 21 tons, ⅜ in. under 23 tons, ½ in. under 24 tons; all bars and L irons being required to bear a tensile strain of 25 tons before fracture. Messrs. Clarke, Reeves, & Co., American bridge-builders, specify in their work that all bars subject to tensile strains shall be tested to 20,000 lb., or nearly 9 tons per square inch, and struck a smart blow with a hammer while under tension, and if any show signs of imperfection they shall be rejected. I mention this foreign test because in a competition this firm secured a contract against English firms. For bridges of large spans some engineers specify different tests for the larger spans: for a 100 ft. span, average breaking-strain of plates per square inch to = 45,000 lb., or 20$\frac{1}{10}$ tons; for the same span, average breaking-strain of channel irons and bars per square inch, to = 50,000 lb., or 22½ tons; for a 200 ft. span, all parts to be exposed to a tensile strain of 60,000 lb. per square inch, = to 26·78 tons. In building Blackfriars Bridge, experiments were made from time to time, as mentioned by Mr. Carr in a paper read before the Institute of British Architects, and the extension of 1·625th part of the length was given by strains varying from 13 tons to 15 tons (instead of 16 tons, as specified); but even with this, the elastic limit is just about four times the working load, which is ample allowance for safety, taking into account a very large deterioration for time and corrosion. The limit of elasticity of wrought iron under tension is that point at which the elongation ceases to be in uniform proportion to equal additions of load, and commences very nearly with the point at which visible set takes place. A bar 1 ft. long, and 1 in. sectional area, should elongate at least 15 per cent. before breaking. The crushing weight is from 12 to 15 tons per inch section, or about half that of tensile resistance. It is sometimes specified that it must be equal to 16 tons per inch, and that it must not show any signs of failure at 8 tons per inch. In specifying or ordering wrought iron, size as well as quality must be borne in mind. L iron, without extra price, runs from 3 ft. to 25 ft.; T iron, without extra price, runs from 3 ft. to 21 ft. Some L and T irons are rolled from 30 ft. to 40 ft.; as a rule, it is of the middle size that long lengths are rolled. L iron can be got rolled up to 40 ft. without any extra charge when the specification is a good one, and does not include more than a fair share of such lengths; and they may even be rolled to 50 ft. and 60 ft., but the difficulty of carriage enhances the cost. Plate iron must be of a regular shape, and should not exceed 15 ft. by 4 ft., otherwise an extra charge will be claimed for rolling. Mr. David Kirkaldy has just completed a valuable set of experiments upon wrought-iron plates manufactured by Mr. Fred. Krupp, of Essen, Rhenish Prussia, and six Yorkshire firms. The experiments were made from plates, 4 ft. by 3 ft. by ⅝ in., ½ in., and ⅜ in. thick,—those most generally used for boiler-making. 324 specimen tests were made from pieces of these plates, and are carefully preserved in Mr. Kirkaldy's museum. The experiments have been made (1) to ascertain the elastic and ultimate strength, softness, and ductility under pulling stress; (2) to ascertain the effects produced by drilled holes and by punched holes under pulling stress; (3) to ascertain the resistance to, and effects under, bulging stress; (4) to ascertain the resistance to, and effect under, bending stress. The facts elicited in these experiments, which are very voluminous, will convince the Admiralty that they should at least give Krupp's plates an equal position with the Yorkshire ones.

Cast Iron.—In round numbers, the strength of cast iron in *compression* equals the square of the tensile force, or, in other words, the resistance that cast iron of good quality gives to a crushing or compressive strain is variously stated by authorities on the subject at from 40 to 43 tons per square inch of section, and from 6 to 8 tons per

* By Mr. R. M. Bancroft. Read at the Civil and Mechanical Engineers' Society, and embodying the particulars of a number of experimental tests not yet published elsewhere.

sectional inch for a tensile or stretching strain. Tabulated it stands :—

	Breaking Strain.	Safe Working Strain.
In compression	40 to 48	7 tons
In tension.....	6 to 8	1¼ „

It is clear from this that cast iron of good quality may in compression be strained to one-sixth of its greatest strength, and in tension to about one-fourth. Cast iron of good quality will, when first broken, have a crystalline texture, and a slight indentation will be made if struck smartly with a heavy hammer. Sometimes this metal is specified to bear a tensile strain of 2½ tons before loss of elasticity, and 6½ tons per square inch before fracture. Test-bars should be run each day as the castings are being made, and a good plan is to specify that the test-bars must be cast on to the ends of the castings. One test is, that a bar, 2 in. deep × 1 in. wide, placed on bearings 3 ft. apart, with a load of 25 cwt. placed on the centre, should give ¼ in. deflection and carry 27 cwt. without breaking. A second test is that of a bar, 1 inch square, placed at 4 ft. 6 in. bearing. In this test the bar should not break with a less load than 600 lb. placed on the centre. The above tests are for iron to be used in compression. When required to be used in tension, even higher standards are advisable. Some engineers insist that these shall be *dead weights*, and that no strain shall be applied in any way by levers; and in important contracts test-bars must be cast in duplicate, one to test, and the other marked with the date when run, and kept for future reference by the engineer. The area of the flanges of cast-iron girders should be in the proportion of 6 or 7 to 1; but the upper flange, where the girder is isolated, and not held in position by the structure itself, should be proportionally wider, according to each particular case, as it has to resist flexure, which would possibly deform it before compression of the flange could occur; but where the web and the upper flange are supported by the structure itself, as in the cases of arches and flooring, the above proportion may be taken. As a general rule, we may, in designing cast-iron girders, make the depth from one-twelfth to one-sixteenth of span; bottom flange, two-thirds to three-fourths the depth in centre; top flange, one-third to one-half the width of bottom; maximum span, 25 ft. With greater spans than this wrought iron becomes as economical, and safer. I believe some of our members are of opinion that strengthening webs or ribs should not be cast in girders, as the metal is drawn away from the flanges in cooling; others say that at the junction of web and flange, the rib, if broken away, will frequently be found honey-combed.

Rail Tests.—When we consider that there are 125 tons of rails and 64 tons of chairs used in each mile of single-line railway, the importance of rail-tests will be apparent. The usual modes of testing rails are :—1. Dead central weight, or static test; 2. Dynamic, or test by impact; 3. A combination of first and second,—first by the central and afterwards by the falling load; 4. Chemical or acid test. 5. By rolling weight. To these might be added that of torsion, or twisting. It should be borne in mind that tests ought to be such as can at all times be easily applied, and not to cause unnecessary inconvenience to the contractor in carrying out his contract. Climate has great influence upon rails, for in tropical countries a comparatively hard rail might be employed, and a greater amount of duty might probably be obtained than from a softer rail. In practice, any sleeper may be badly packed, or decayed, so as to offer little resistance; therefore it follows that a rail to be safe should not break or take a permanent set under the weight of an engine. If every other sleeper were taken away, this would always give a bearing at which to test rails for different lines or gauges. A good steel rail, as used on the English railways, will deflect about $\frac{3}{16}$ of an inch in a span of 6 ft., when a locomotive engine is passing over it. Taking the tests *seriatim*, it seems to me that the test by a falling weight is more to detect brittleness than a test of deflection, and being a destructive one, only 1 or 2 per cent. of the quantities are tested, and the rest of the turn is supposed to be like them. For the test of brittleness, it has been suggested that a good method would be to drop rails from a given height on to a hard platform, which would certainly detect any *cold short* ones. To detect brittle rails is certainly most important; yet it is difficult to imagine how the loads passing over rails come with the suddenness of a blow from a test monkey. Some engineers say the endeavour to ascertain whether a rail has sufficient toughness by submitting it to the action of a falling weight is most deceptive; the test goes as far beyond the mark as that by a dead weight falls short of it, because it requires an amount of toughness which is quite unnecessary, and inconsistent with a proper degree of hardness. Dead central weight tests determine the strength of a rail as a girder, and are adopted by some engineers, who consider nothing so good as the simple application of gradually increasing bending stress to the centre, the deflection and set being noted after each successive increment of stress. These tests being usually made upon bearings varying from 2 ft. 8 in. up to 5 ft. and 6 ft., it is a question whether the amount of deflection shown by so short a length of rail without being damaged by a permanent set is not too small to be accurately measured; and the difference of the deflection which would be exhibited by a short piece of very good iron and a similar piece of very bad iron would at any rate be too small to afford any certain gauge of its qualities. It would seem that a double test of dead weight, and afterwards by impact, is a severe and, one would think, a satisfactory one, and, unlike a chemical test, is simple, quick, and inexpensive; it severely tests the qualities of material and workmanship. Some engineers adopt this method, and though these tests are not designed to represent the wear the rail would have to undergo, yet they are, combined, the safest and simplest that we are at present able to apply. The acid test is made by cutting off a slice from the end of a rail, and, after polishing, immersing it in dilute acid, which eats away all impurities, leaving a lot of cavities and furrows, thus showing up the fibre or grain of the metal very plainly. With most metals chemical analysis is in itself a complete and sufficient test of quality, but not in steel. The toughness of steel may be altered by sudden cooling, and although the effect of this operation, and generally the effects of tempering, are greater when the quantity of carbon is considerable, yet it acts more or less in the mild qualities of steel, so that we cannot rely entirely on the aid of the chemist, but must fall back on mechanical tests, which prove not only the material, but the workmanship. The rolling-weight test is made by heavy rollers fixed in a frame-work and radial bars connected to a central boss after the form of a turn-table; motion is imparted to a central vertical shaft by means of shafting and wheels underneath, which is driven by steam-power. It can be made with or without springs; without springs the test is more severe, but by using springs the rollers may be lightened and greater weight thrown into the frame. The rails to be tested are formed into a circle or polygon, supported on sleepers packed with ballast in the usual manner. If the rails are bent into a circular form, Mr. Price, the patentee, says in his experience the texture of the iron is of no moment, provided the rails are bent at a dull red heat, but they may be arranged as a polygon, which plan possesses the collateral advantage that the rollers wear more evenly over their entire surface. Rails weighing 86 lb. per yard are tested by a dead weight produced by hydraulic pressure. A piece of the rail is placed upon 5 ft. bearings, and a slightly curved iron surface 3¾ in. in width is made to press upon the centre of the rail. The test is that under these conditions a pressure of 40,000 lb. shall not deflect the centre of the rail more than 1 in.; also that 60,000 lb. shall deflect it 9 in. without breaking it. The following are tests for iron rails 75 lb. per yard :—1. Each of these rails placed on two supports, 3 ft. 8 in. apart, must carry for five minutes in the centre between points of support a hanging weight of 12 tons, deflection 0·15 in. as a maximum, and when the weight has been taken off the permanent set must not be more than 0·04 in., or 1 millimètre, and on condition that at the second placing of the same weight the deflection does not increase more than 1-150th of an inch or 1-5th of a millimètre. 2. Each rail in the same position must carry also for five minutes without breaking a weight of 30 tons; then, having nicked the surface of the head, it shall be tested to breaking by the blows of a tup 648 lb. weight falling 18 ft., and the fracture must show a combination of iron conforming to the aforesaid condition. 3. Each of the two halves of broken rail placed on two supports, 3 ft. 8 in. apart, shall be tested by the blows from a tup 648 lb., falling 7 ft. on the centre between the point of support. Under this test the rail may bend, but must not show any trace of destruction. The Vignoles section of rail would seem to have some advantage over the double-headed, as the bottom flange is placed at a greater distance from the neutral axis, besides resisting side strains and torsions, and, as a matter of practice, none but ductile tough iron can be rolled into a wide flange.

Test for Bessemer Steel Rails, 80 lb. per Yard. — Rails to be taken from each day's rolling, and placed upon bearings 3 ft. apart, when a ball weighing 10 cwt. is to be raised 10 ft., and dropped three times, when the deflection must not exceed 3 in.

Testing of Fish-plates for Rails.—1. Six fish-plates to be taken at random from one day's rolling, and bent to an angle of sixty degrees, without any sign of fracture. 2. Holes to be punched at a distance from the edge equal to the diameter of hole without bulging the metal at the sides.

Weakening Rails by Drilling and Punching.—An experiment is also mentioned by Hackney, in his "Manufacture of Steel." 1. A piece of rail with no holes in it stood a blow of one ton, falling 20 ft. 2. A piece of the same rail, with a punched hole through the web, broke under the first blow at a 3 ft. fall. 3. A piece with a drilled hole the same size, while it stood the first blow at a 2 ft. fall, broke with the second blow at a 4 ft. fall.*

A LOSS TO ITALY.

To a young country like Italy, just battling with the incongruous elements from which its unity is to be consolidated, nothing more to be regretted can occur than the loss of any one of her great and good men, the representatives of her past traditions,—grand examples of noble energy and patient working for the accomplishment of the regeneration and unity of their country. Italy now mourns one who, honoured as patriot, *savant*, and perfect Christian gentleman, has just passed away.

The Marchese Gino Capponi was born in 1792, in Florence, of one of her most ancient families. At the age of seven years his family, following the Fortunes of Ferdinand III., driven from Tuscany by the French, were exiled from Florence for four years, after which his life was devoted to study until the age of twenty-one, when he formed one of a deputation sent to Paris to offer assistance to Napoleon I., after the fatal battle of Leipzig. On the restoration of the House of Lorraine, he was made Chamberlain to the Grand Duke Ferdinand III. He afterwards travelled in France, England, and Germany, to gain knowledge and experience. When his country had need of his services, he left his studies to serve her as statesman, and from love of his country in 1847 he consented to form a Ministry. In 1848 the Capponi Ministry fell, to the great regret of all well-thinking men. He then retired into quiet life, giving his time to the study of history, to the publication of works of interest, and attempting to raise the intellectual tone of the minds of his countrymen. In 1859 he endeavoured to give friendly counsel to the Grand Duke when his wretched administration was threatening to stir up the people to revolt. On the accession of Victor Emmanuel, Capponi took his seat in the National Assembly, and voted with his colleagues for the abolition of the Lorraine rule, and the union of the small grand duchy to the subalpine kingdom, in the conviction that it was in the way of accomplishing the desired national unity. After the institution of the kingdom of Italy he was named senator. He had begun authorship in his twentieth year, publishing "Observations on the Critical Examination of the First Voyage of Americus Vespucius to the New World." From that time he never ceased writing and publishing important historical essays. His latest work, published last year, and of which a second edition appeared a few weeks ago, was the "History of the Republic of Florence."

From over-study, and reading sixteen hours a day, he became blind in his last years. In April next he would have completed his fiftieth year of membership of the Academy of La Crusca. Nothing of interest in arts, science, or literature but claimed his attention. He had been in his life the friend of Napoleon I. and the Count of Paris, Chateaubriand, Lord John Russell, Gortschakoff, and Thiers; had had relations with all the diplomatists and ministers of Europe during the last fifty years; had been the friend and intimate acquaintance of all the greatest men of talent

* To be continued.

in Italy and of his age. History was his principal study,—Italy the first in his thoughts and affections,—and he was one of the greatest promoters of her regeneration, by his words, his writings,—every act of his life.

His wealth enabled him to do good in his generation. He presided over many of the different artisans' clubs and societies. His funeral, which took place on the 5th, was attended by the representatives of every class in Italy,—from the King (by the Duke of Genoa), the army, navy, every college in Italy, academies of fine arts, the ministry, artisans, and every Florentine noble family, professors, and others.

His body was, after being embalmed, exposed in a *chapelle ardente*, to which were permitted to pass his friends and relatives,—a few hours before the long procession was formed to bear him to his last resting-place.

The loss of this man, of such distinguished intellect, and high, pure patriotism,—a man so good, so courteous, so loving to rich and poor, so grand an example to the rising generation of his country,—cannot be overrated. It might be considered less serious could Italy produce among her young nobles many who knew how to live and work, and give their lives for the good of their country, as he has done.

MOVEMENT IN INDIA.

THE Indian journals state that Maharajah Holkar imported a large Durbar room, made of iron, at a cost of 4,000*l.*, for the reception of the Prince of Wales at Indore.

The Behar people are determined to signalise the visit in a really worthy manner, and have already subscribed the handsome sum of 40,000*l.* for the establishment of an industrial school by which they intend to commemorate it.

Rai Dhunput Sing and Luchimput Sing, bankers of Calcutta, and Baboo Hurish Chunder, of their combined intelligence and loyalty, have offered to contribute, the former 40,000 rupees, and the latter 45,000 rupees, for the advancement of science.

When the Duke of Buckingham went to Madras it was supposed that it was merely as a stepping-stone to the Viceroyalty; but this error has been exploded, and his Grace already shows a disposition to become a really hard-working Presidential Governor. He has just made his first official visit to the Godavery Irrigation Works. This project was first sanctioned in 1844, and has only very recently been completed. At the head of the delta, at Dowlaiswaram, the deep bed of the Godavery river is 22 ft. above high-water mark, and the highest part of the delta requiring irrigation is 30 ft. above the same level. From Dowlaiswaram the river flows to the sea, on the crest of what may be termed a great natural embankment, which is from 6 ft. to 24 ft. above the level of the surrounding country. The bed of the river, therefore, only needed to be raised 10 ft. or 12 ft. to give the requisite head of water. This was effected by an anicut, or dam, at Dowlaiswaram, where the river is about three miles and a half wide. Advantage was taken of the existence of four islands, which saved 1,000 yards of building; but still it was necessary to construct a stone dam 130 ft. broad at the base, 12 ft. high, and two miles and a half long. The land is very rich, being composed chiefly of alluvial soil. There can be supplied from the anicut 12,000 cubic feet of water per second, during the high period of the river's volume, and 3,000 ft. at its lowest ebb. The former quantity may be depended on from July to October, when the paddy grounds are at their thirstiest, and consume a cubic foot for every forty acres per second. The delta, which contains about 2,000 square miles, is divided into three natural sections,—the first between Samalkota and the Eastern Godavery. Here the main line of the canal passes along the bank of the river, while two branches proceed to Samalkota and Cocanada. In the second section between the two branches of the river, which is of surpassing richness, a main channel passes down the left bank of the river, and at the eighth mile branches into two. The right-hand branch is again subdivided six miles farther on, and one line crosses a minor branch of the Godavery, by the Gunnarum brick aqueduct, constructed by Lieut. Haig, 2,248 ft. long, on forty-nine arches. The third section has a main channel, carried out for eight miles, when it breaks off into several branches, having a united length of 220 miles. Altogether there are 480 miles of main channels to irrigate 780,000 acres. In 1864, an extension of the Godavery line, completing the water communication between the Godavery and Krishna works, was sanctioned, and since then improvements have been executed from loan funds. The traffic on these canals, which are used for navigation as well as irrigation, is carried on by upwards of 50,000 boats. There is still room for much profitable extension of these great works; and it is to them that the new Governor of the Madras Presidency has first directed his attention.

While writing of Eastern affairs, we may note that the European residents of Shanghai intend to erect a memorial of the late Mr. Margary.

AN ART TRUST IN ABEYANCE.

AN application was made in the Rolls Court, Dublin, on the 9th of this month, that a scheme settled by the Court of Chancery in 1860 for the management of the charitable fund bequeathed by a Mr. George Archibald Taylor, might be varied. The abeyance of this trust is suggestive of some remarks, which are perhaps better unsaid at present. Mr. Taylor died upwards of twenty years ago, in 1854, leaving a sum of 2,000*l.* to be applied for the encouragement of art in the city of Dublin. His executors filed a petition for the settlement of a scheme which was carried out by the execution of a deed in 1863. This provided that prizes should be annually given to the most deserving art students in Dublin, who competed for them by painting pictures. Messrs. Charles Leech, Q.C., and John Chambers, the two trustees of the will, with two other trustees appointed by the Royal Dublin Society, aided by a person appointed by the Royal Hibernian Academy, were to act as judges. Now comes the strange part of the matter and management. It is stated that, from want of merit of the candidates and other causes, the fund has now accumulated to the sum of 3,044*l.* 15s. Government New Three per Cent. Stock. The amended scheme proposes that the annual proceeds of the fund should be applied to sending deserving students abroad to study under the best foreign masters, the Royal Hibernian Academy to retain a voice in the management of the charity, having the power to appoint a trustee. This scheme is opposed by the Royal Dublin Society, but only so far as it gives power to the Royal Hibernian Academy to appoint a trustee. At the conclusion of the hearing his Honour directed the matter to stand over, in order that further particulars might be obtained as to the working of the existing scheme for each year since 1863. He intimated at the same time that he thought there would be some difficulty in giving effect to the proposed new scheme. Here we have the case of a trust for art purposes lying waste and unapplied for the space of nearly a dozen years, while during that time the Government have been repeatedly solicited for grants, large or small, for the encouragement and extension of art and science in Ireland. It is a question if this trust will not come in for some attention on the part of the advisers of the Government in Ireland, pending the maturing of the State plans for the consolidation and enlargement of Dublin Metropolitan institutions devoted to science and art.

REPORT OF THE BOARD OF TRADE ON THE PRIVATE BILLS IN PARLIAMENT.

ON Monday last the Board of Trade presented its annual report to Parliament on the Railway, Canal, Tramway, Gas, and Water Bills to be investigated before the Committees during the present session. From this document it appears that the number of railway Bills promoted by existing companies is 90, to make 155 miles of new railways, with an aggregate capital of 21,487,365*l.*, and of this sum 16,335,075*l.* are proposed to be raised in shares, and 5,152,290*l.* by loan. Of these Bills 69 are in respect of English lines, 132 miles in length; 11 for Scotch lines, 18 miles long; and 10 for Irish lines, 5 miles; the capital for the English lines being 18,246,515*l.*; Scotch lines, 2,799,300*l.*; and Irish lines, 441,550*l.* The number of Bills promoted by new companies is 42, for the construction of 550 miles of railway, for which the capital proposed to be raised is 15,167,329*l.*, of which 11,343,000*l.* is in shares and 3,824,329 by loan. The Bills promoted by new companies for English lines is 35, to make 417 miles of railway, at a cost of 13,569,079; 3 Bills for Scotch lines, 35 miles long, cost 466,600*l.*; and 4 Bills for Irish lines, 98 miles in length, cost 1,131,650*l.*; the total aggregate capital proposed to be raised by existing and new companies being 36,654,694*l.* There are 5 tramway Bills, for constructing 25 miles, with a capital of 166,600*l.* Four of the Bills are in respect of tramways in England and 1 in Ireland. There are 40 gas Bills, capital 4,932,972*l.*, of which 37 are English, and 3 Scotch Bills. The water Bills are 29 in number, 25 being English, 3 Scotch, and 1 Irish Bill, with a proposed capital of 4,552,000*l.*, the general total being 206 Bills, for making 705 miles of railway and 25 miles of tramway, and the gross proposed capital for the several undertakings, 46,306,266*l.*

The applications to the Board of Trade for provisional orders to construct new works are 7 for tramways in England, 12 miles in length, capital 36,393*l.*; 12 gas supply, England, capital 238,916*l.*; 8 water supply, England, capital 138,500*l.*; and 3 gas and water supply, England, capital 37,500*l.*

Of the bills promoted by existing railway companies, the most comprehensive are those of the Midland Company, the proposed capital being 4,033,333*l.* for the construction of 16 miles of new railways, and other works and buildings on the company's existing lines. As regards capital proposed to be expended under the bills promoted by existing companies, the London and North-Western Company stands next in order, with a proposed expenditure of 2,066,800*l.*, for the construction of five miles of new railway, and various other works. The Lancashire and Yorkshire Company's Bill, capital 2,000,000*l.*, is for powers, amongst other things, to make seven miles of new railway, to enlarge their Exchange Station at Liverpool, and for other works. The Manchester, Sheffield, and Lincolnshire Company propose, under their Bill, to raise 1,333,300*l.* for new works; the North-Eastern, 1,332,000*l.*; the Metropolitan, 1,283,333*l.* (chiefly for the construction of the proposed line from Aldgate to Whitechapel, the Hammersmith and Walham-green line, and the Kingsbury and Harrow line); the South-Eastern, 666,666*l.*; Great Eastern, 640,000*l.*; Great Western, 600,000*l.*; London and South-Western, 501,858*l.*; London, Chatham, and Dover, 500,000*l.*; and the London, Brighton, and South Coast, 266,666*l.*

The Imperial Gas Company, by their Bill, propose to raise an additional capital of 1,408,000*l.*, 1,300,000*l.* in shares, and 108,000*l.* on loan; whilst the Bill of the South Metropolitan Company provides for raising 250,000*l.* in shares, and the same amount on loan.

THE MAINTENANCE OF PUBLIC BUILDINGS AND PARKS IN LIVERPOOL.

THE annual statement showing the income and expenditure of the Corporation of Liverpool during the year just ended has been published, and contains some interesting statistics as to the outlay on the several public buildings and places of recreation within the borough. From this statement it appears that the ordinary receipts during the year amounted to 225,609*l.*, and the extraordinary receipts were 61,268*l.* Of the ordinary income 114,754*l.* were derived from rates, 98,196*l.* from real and personal estate belonging to the corporation, and 11,966*l.* from the markets. The figures also show that there was a large profit on the markets, the receipts being almost double the expenditure. The baths and washhouses were also a source of profit, the receipts being much in excess of the expenditure. Some years ago the corporation erected a number of houses in flats for the industrial classes, at the north end of the town. These several blocks are situated in that part of the borough known as St. Martin's-in-the-Fields, and are called St. Martin's Cottages. The rents which they produced during the year just ended amounted to 1,606*l.*, out of which 725*l.* were expended, leaving a balance of 880*l.* Amongst other items the payments included 178*l.* for rates and taxes, 85*l.* for the superintendent's salary and clothes, 329*l.* for gas and fittings, and 108*l.* for general repairs. These figures may enable builders who know the premises, and their original cost, to calculate how far such property can be considered a profitable investment. We further learn from the document that the expense of maintaining the town-hall, the municipal offices, and St. George's Hall and the Law Courts, was 9,823*l.*, after deducting 2,852*l.* received, and that the borough prison at Walton cost 24,432*l.* last year. The maintenance of parks and places of recreation and instruction

Steele's Cottage, Haverstock Hill.

involved an expenditure of 43,392*l.*, and in addision to that sum 3,443*l.* were spent on Sefton Park in the year, 1,147*l.* on Newsham Park, 1,578*l.* on the Botanic Gardens, 1,045*l.* on Stanley Park, 496*l.* on Wavertree Park, and 244*l.* on Sheil Park. The payments on "improvement" account amounted to 33,357*l.*

SOME OLD HOUSES AND THEIR STORIES.

SIR RICHARD STEELE'S COTTAGE NEAR HAMPSTEAD.

THERE is nothing very interesting in the appearance of that extremely modern row of shops, Steele's-terrace, which stands on the left as you ascend Haverstock-hill, on the way to Hampstead, and there is nothing even remotely suggestive of wildness and solitude in Steele's-road, at the corner of that terrace. Yet before that road was made, or those shops built,—that is to say, about ten years ago, when the low old-fashioned cottage which gave them their respective names was still standing,—rustic and picturesque elements were not altogether wanting, and visiting it one might still imagine what a wild, solitary, out-of-the-way place it was when Sir Charles Sedley came to it to die, and a few years afterwards when Sir Richard Steele sought it as a safe hiding-place from importunate creditors.

In those days, that ancient little house must have seemed one of the most lonely and isolated of outcast buildings. Hidden by wild patches of woodland, lingering relics of the primæval forest of Middlesex, with great stretches of waste land surrounding it, and with large fields, meadows, gardens, parks, and several little villages between it and London, and with a road to it of the rudest and loneliest description, such as no horsemen dare venture upon in bad weather, and few would care to venture upon in any weather, the place must have been just such as a distrustful, gloomy, world-weary man might choose to die in,—just such as must have seemed most safe for any poor hunted wretch flying from the terrors of a debtors' prison when such terrors wore their ugliest and most cruel expression.

In one of the low-browed, wainscoted, quiet little rooms of this lonely house, on the 20th of August, in the year 1701, Sir Charles Sedley, the famous wit, was breathing his last. Shrinking from the future, and having no satisfaction in the present, he may have looked back, as dying men commonly do, upon his past; but neither comfort nor hope could he have found therein. It had been one long scene of folly, dissipation, debauchery, drunkenness, and crime, ending in political conspiracies and turbulent excitement.

He had been the most intimate friend and constant companion of one described in Chambers's *Encyclopædia of Literature* as "hospitable, generous, and *refined*," namely, Lord Buckhurst, afterwards Earl of Middlesex and Duke of Dorset,—

"Dorset, the grace of Courts, the muse's pride," *

a famous nobleman and wit, whose favourite joke had been the very refined one of displaying himself naked at a window, or, sword in hand, in the streets. And they twain had been the sworn friends and companions of brave, licentious, blasphemous, but, when worn-out and dying, at last penitent John Wilmot, Earl of Rochester, who died aged 33, who once admitted that he had been drunk every day for five years, and who wrote such elegant verses, and such excellent letters to his son on the duty all human beings owe to God, themselves, and their parents. With these great noblemen, upon whom the lord-loving writers of the last century heaped disgusting and fulsome flattery, which has been echoed and re-echoed ever since, and with Sir George Etheridge, Sir Thomas Ogle, and other "mad wags" of Charles II.'s "merrie" mad court, he had been guilty of almost every conceivable offence against society.

These mad wags were never so jolly as they were when in some tavern or brothel they met to boast in lewd songs and speeches their conquests over simple-minded, unsuspicious women, who had been good enough to think them truth-speaking, honourable men; and Sir Charles Sedley on such occasions outshone them all. Rochester wrote some lines which have been popular ever since, in which he admitted even his inferiority to Sedley in what he called the "prevailing gentle art,"—that is to say, in those gentle arts of refinement, lying, false-swearing, deceit, and treachery, whereby disgrace and misery are brought into honourable and happy homes, and loving, confiding girls are suddenly overwhelmed with horror and despair by finding—if we may speak it waggishly—"too late that men betray." Did the wasted forms and white faces, and mournfully reproachful eyes, of ruined women visit Sir Charles Sedley on his awful death-bed in this old cottage? Did he see them wringing their thin hands, and piteously wailing over God's tender-loving, blessed, heart-winning gift of beauty as one which he, Sir Charles, had impiously converted into a life-long curse? Men have seen and heard such things in the dark valley of death's shadow, and grown wild with fear and horror of future punishment. But we have no record of Sir Charles Sedley's last thoughts, or description of his passing away. We can only look upon the old house and think of probabilities.

It is also probable that through that awful silence of departed years the stern voice of Lord Chief Justice Foster may have come back to him as he once heard it when he stood a prisoner in the dock of the King's Bench Prison with my Lord Buckhurst scowling beside him, they being charged with a crime too gross for print. It was then a year of great national disasters and troubles—1663—and the Lord Chief Justice indignantly calling him "Sirrah," said, "It was for him, and for such wicked wretches as he, that God's anger and judgments hung over" them. This was bold speaking for even a Lord Chief Justice when he was addressing a "merrie" monarch's favourites, and it may have misled meaner men into supposing that in the cause of right against wrong they might do the like, which was a very serious mistake.

Pepys, alluding to a similar "frolic" in 1668, wrote,—"Pierce do tell me, among other news, the late frolic and debauchery of Sir Charles Sedley and Buckhurst running up and down all the night, almost naked, through the streets, and at last fighting, and being beat by the watch and clapped up all night; and how the king takes their parts; and my Lord Chief Justice Keeling hath laid the constable by the heels to answer it next sessions, which is a horrid shame"; and shows us how vast was the difference between a justice-loving Foster and a time-serving Keeling.

But other things more pleasant may have come back to the dying man in that lonely cottage on the steep, wild hill-side near London. He may have smiled faintly to hear the echo of his monarch's praise, for Charles II., with whom he was a special favourite, said he had obtained a patent to be Apollo's viceroy at the English Court. And a faint glow of pride may have quickened for a moment his congealing blood as he recalled the praises lavished upon his wit and courtliness by one who intrigued with heartless Lady Shrewsbury, and killed her husband in a duel, a spirit of kindred nobility and virtue, the Duke of Buckingham, who playfully called Sedley's power over female hearts witchcraft, which name, seeing the wickedness of it and the evil it wrought, seriously meant, would be not altogether a bad name for such a power, unless one preferred devil's-craft.

But it was perhaps neither the wickedness of his life nor the pleasures of it which occupied the old beau's dying thoughts. He had been proud of and had loved his daughter, and one of his friends, the king's brother, James Duke of York, High Admiral of that English fleet which the Dutchmen laughed to scorn, combined to do for his daughter what he—Sir Charles—had so often done for other men's daughters, and so brought home to him certain uncomfortable sensations and bitter feelings. Be sure thy sins shall find thee out. From that hour Sir Charles became a changed man, and when James Duke of Buckingham became James King of England, although Sedley's dishonoured and degraded daughter was elevated in rank and had become

* Pope, Prior, Congreve, Addison, Dryden, and others, wrote of him in a similar strain.

Countess of Dorchester, the one feeling dominant in the heart, and the one idea dominant in the brain of Sir Charles Sedley, was revenge. The poet and dramatist—for Sir Charles was both—abandoned everything for politics, attended Parliament regularly, was foremost in opposing the king's arbitrary proceedings, and when a conspiracy was secretly formed to dethrone his daughter's seducer, he was first amongst the noblemen and gentlemen who on various false pretences went over to Holland, and in conference with the Prince of Orange arranged the proposed invasion of England by the Dutch. He risked his life and devoted all his energies to the cause of political and religious freedom for his country, but with no higher motive, we fear, than the gratification of personal revenge,—a feeling which peeped out when grimly and wittily he replied to one who was curious to ascertain why he was so bitter and determined an enemy to King James,—"I hate ingratitude. The king made my daughter a countess; I will make his daughter a queen."

Curiously enough the very year of Sir Charles Sedley's death was that in which William of Orange—our William III.—being dead, the only surviving daughter of the exiled king, James II., was crowned Queen of England.

In that year, a merry, talented young Irishman, of English descent, was in the army, leading a life of riotous dissipation and licentious pleasure, when, determining to mend his ways, he published a little treatise called "The Christian Hero," with a design,—as he affirmed,—of making it the guide of his future conduct. This was Captain Richard Steele.

But Steele's life continued in its old evil course, and grew from bad to worse, and his "Christian Hero" only brought upon him the railery and mockery of his companions. So he published a comedy to do away with the impression that he wished to reform, and this, which was acted for the first time a few months after Sedley's death, he called "The Funeral; or, Grief *à la Mode*." It was represented successfully at Drury-lane, Cibber, Mr. Oldfield, Pinkelhman, and some other famous performers of the day, appearing in it.

"Steele," says Macaulay, who regarded him with no favour, "had left college without taking a degree, had been disinherited by a rich relation, had led a vagrant life, had served in the army, had tried to find out the philosopher's stone..... was one of those people whom it is impossible either to hate or respect. His temper was sweet, his affections warm, his spirits lively, his passions strong, and his principles weak. His life was spent in sinning and repenting; in inculcating what was right and doing what was wrong."

In 1709, on the 12th of April, when Captain Steele was in his thirty-eighth year, he began to publish the *Tatler* in concert with Swift, who some little time before had published some humorous pieces under the name of Isaac Bickerstaff. It was a very small sheet, and appeared three times a week. In 1709, when, as usual, he was in "difficulties," and was a Commissioner of the Stamp Duties, and held the post of Gazetter, fresh troubles arose. In August, 1710, he was for some little time locked up at a house called the Bull-head, in Vere-street. In 1711, Steele, although still in difficulties, was living luxuriously in a house he had built and richly furnished at Hampton-wick, adjoining the palace, which he called "The Hovel," on which, together with its furniture, he had borrowed of his friend, Addison, who could ill-spare the money, a thousand pounds to get him out of one of his constantly arising difficulties. Macaulay says, "Steele's negligence or dishonesty provoked Addison to repay himself by the help of a bailiff," and he adds, "we cannot join with Miss Aikin in rejecting this story. Johnson heard it from Savage, who heard it from Steele. Few private transactions which took place a hundred and twenty years ago are proved by stronger evidence than this. But we can by no means agree with those who condemn Addison's severity." Macaulay then goes on to excuse Addison by conjecturing, very picturesquely, what the real story may have been.*

But the curious thing here is that about the actual truth there never was any mystery. It appears in the original letters of Victor (1776), in John Nichol's collection (1787), in George Cunningham's life of Steele, and, in short, it has been given in print scores of times. Steele's extravagances were largely due to his possession of this house, and had, it seems, produced the usual result. About the time when the bond was forfeited, "Addison," says Victor, "dealt at this time with his friend, as he did afterwards with his favourite Sir Roger de Coverley, whom he deliberately killed, through fear that somebody might murder him." After the sale Addison explained his motive to Steele, in a letter sent with the surplus money, which Steele would otherwise never have received, and hoped that the inevitable ruin he was fast nearing might now be happily avoided. The story was told Garrick in a letter from Dr. Johnson, who heard it not only from Savage, but from Mr. Wilks the actor. Steele afterwards told the story to Garrick himself, and to several others, always recognising Addison's conduct as that of a true friend. It is rather an odd but not uncommon way this of ignoring or denying a fairly demonstrated fact, because some one has forgotten, or never read, or been too careless to give, its actual explanation. The *Tatler*, which had enjoyed immense popularity, ceased to appear after Thursday, January 2, 1710. Swift says, "Steele's last *Tatler* came out to-day. You will see it before this comes to you, and how he takes leave of the world. He never told so much as Addison of it, who was surprised as much as I; but, to say the truth, it was time, for he grew cruel, dull, and dry. To my knowledge he had several good hints to go upon; but he was so lazy, and weary of the work, that he would not improve them." In the taking leave referred to, Steele for the first time appears as himself instead of the Isaac Bickerstaff he borrowed from Swift. Everybody now knew who the real writer was, and disguise was useless. He said of the volumes already published (four),—"The general purpose of the whole has been to recommend truth, innocence, honour, and virtue, as the chief ornaments of life; but I considered severity of manners was absolutely necessary to him that would censure others, and for *that reason* and *that only* chose to talk in a mask. . . . I confess my life is at best but pardonable." Thus began and ended the first periodical work published in England.

In the same year and the following March Steele was again associated with Addison in the starting of a new literary venture, and once more in a mask. This was the famous *Spectator*. The year 1712 appears to have found poor Steele again pursued by duns. There was a difficulty at its commencement in paying even the domestic servants, and Gibbs, his butcher, had made himself so obnoxious that it was imperatively necessary that he "and two or three others" should be settled with immediately. Matters growing worse and worse, a hiding-place became necessary, and Steele suddenly disappears. The first clue to his place of seclusion, so far as we are concerned, crops up in a letter he addressed to Pope, which runs as follows:—

"*To Mr. Pope.* June 1, 1712.

Sir,—I am at a solitude, an house between Hampstead and London, wherein Sir Charles Sedley died. This circumstance set me a-thinking and ruminating upon the employments in which men of wit exercise themselves. It was said of Sir Charles, who breathed his last in this room,—

'Sedley has that prevailing gentle art
Which can with a resistless charm impart
The loosest wishes to the chastest heart,
Rouse such a conflict, kindle such a fire
Between declining virtue and desire,
Till the poor vanquish'd maid dissolves away,
In dreams all night, in sighs and tears all day.'

This was an happy talent to a man of the town; but, I dare say, without presuming to make uncharitable conjectures on the author's present condition, he would rather have it said of him,—

'Oh thou my voice inspire
Who touch'd Isaiah's hallow'd lips with fire.'"

The letter concludes by some critical comments upon the poem from which the above last quotation came. Pope replied in a pedantic solemnly commonplace epistle.

We have no clue to the length of time Steele continued in this solitary cottage, but it was long enough to cause it to be traditionally associated with his name from that time to that at which it was removed, and to ensure the memory of its site in the name it gave to the road it stood in and the neighbouring terrace. It is probable that his discovery of the house and residence in it may have been in some way connected with the Hampstead rambles of the famous Kit-Cat Club, which was established in 1703; for there are some traditions of its more famous members calling at this house in "a solitude" to bring Steele away with them to join merry meetings at the Upper Flask on Hampstead Heath, another old house of which stories are told, and one which is still, we believe, in existence.

* Macaulay's Essays, July, 1843, on "The Life of Joseph Addison," by Lucy Aikin.

THE NEW THEATRE OF DÜSSELDORF.

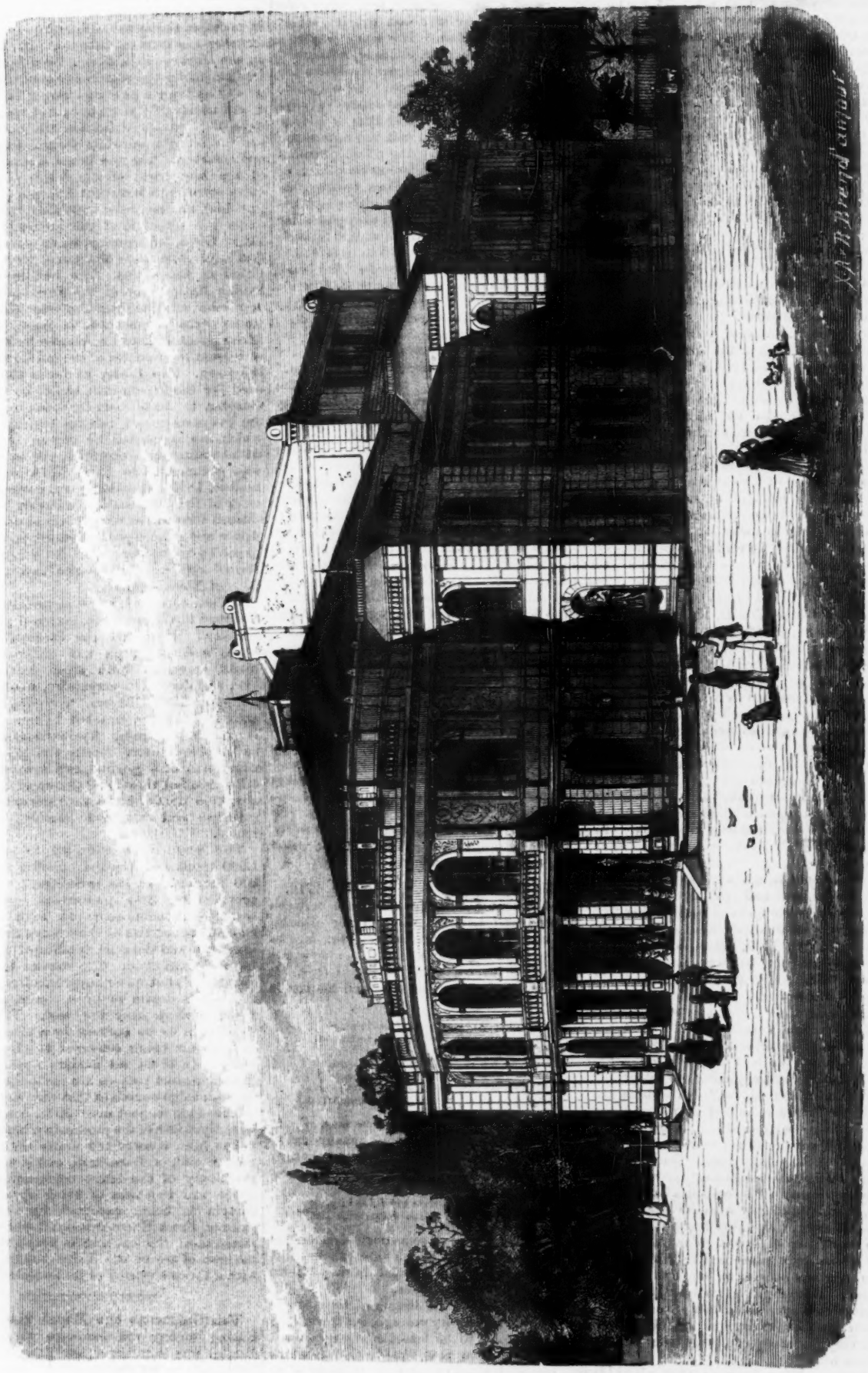
AMONG the many new constructions either completed or still in course of progress at Düsseldorf, the new theatre, of which we give a view, is, perhaps, the most important erection, and one exciting the greatest interest. The old theatre, on the Market-place, having been found entirely insufficient for the requirements of the town, the plan of building a new and larger one was conceived nearly fifty years ago; but various causes have delayed its execution till now, the old theatre being meanwhile several times altered and enlarged. The new house is situated in one of the best parts of the town, close to the entrance of the beautiful Anlagen (ornamental grounds), and has been built after the plans and under the direction of the architect, Professor Ernst Giese, of Dresden, while several Düsseldorf architects were entrusted with the supervision of the works. The building is in the Italian Renaissance of the Dresden school, the originator of which was Professor Nicolai. The works were commenced in September, 1873, under great difficulties, caused by the influx of water and the remains of the old fortifications of the town. The latter, as far as they were not used for the foundations, had to be removed by blasting, to make room for the substructures of the 144 piers upon which the building rests, and which are connected by strong arches. Notwithstanding these obstacles, the superstructure was commenced in April, 1874, and by September, 1875, the building was covered in. The work of finishing the inside having been rapidly pushed forward, as well as that of decorating the inside and outside,—which latter, however, is not expected to be completed for some time—the formal opening performance took place on the 29th of November last.

On entering the theatre, a handsome vestibule, designed in a sober style, makes a pleasant impression. Here are the cashiers' places for boxes and stalls, pit and gallery; flights of broad stairs at both sides leading to the pit; and decorated caryatides, executed by the sculptor, Karl Hilgers, a young Düsseldorf artist. The *foyer*, enriched by mural paintings, is over the vestibule. Two refreshment-bars are to be placed here. Stalls and pit are on the usual plan of a gradual rise towards the back, offering a full view to all the spectators. There are three tiers of boxes, each tier with a separate staircase and exit, and provided with cloak-rooms.

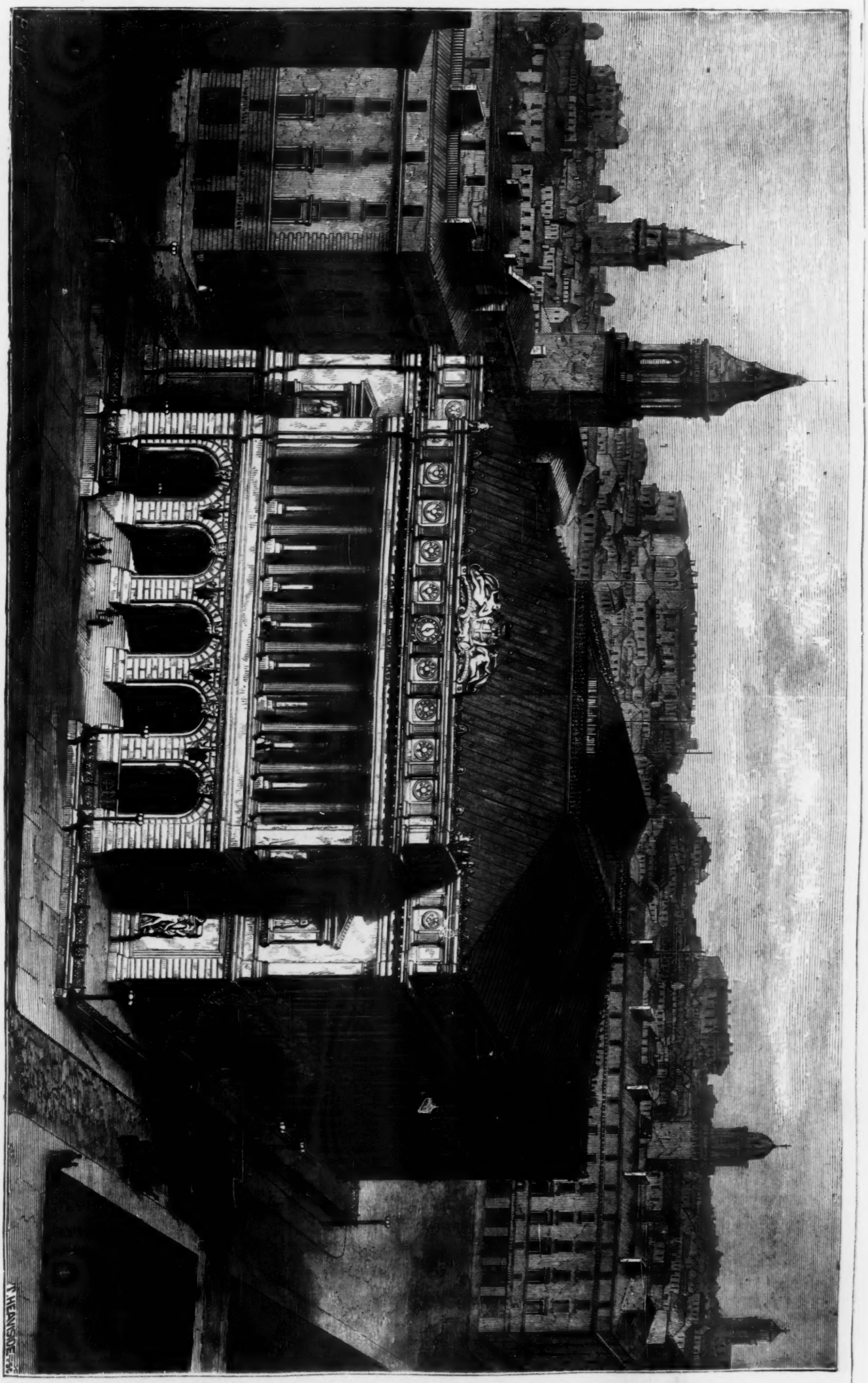
The house is constructed to accommodate 1,500 spectators, the old building holding only 800 persons. In the orchestra, ample room is provided for fifty performers, and—a novel feature—a tuning-room at each side. The acoustic properties of the theatre are said to be excellent, and the same is affirmed of the warming and ventilation. The theatre is warmed by Reinhardt's hot-water apparatus (*coliféres*). The foul air is drawn in by conduits, and escapes through them over the roof. Ventilation in summer is to be secured by a plentiful supply of fresh air being conveyed to all parts of the house. In short, all modern appliances of the most approved pattern are made use of; but we do not pledge ourselves that they are successful.

The stage is just over 50 ft. deep and 72 ft. wide, the width of the proscenium being 33 ft. 6 in. It has been constructed under the direction of Herr Brand, of Darmstadt, and is provided with machinery of the latest construction, amongst which are two sets of flying apparatus. The curtain is being executed by the historical painter, Ernst Hartmann, but it will not be completed until the opening of next season. Thus the seat of art on the Rhine has been provided with a theatre worthy of its importance.

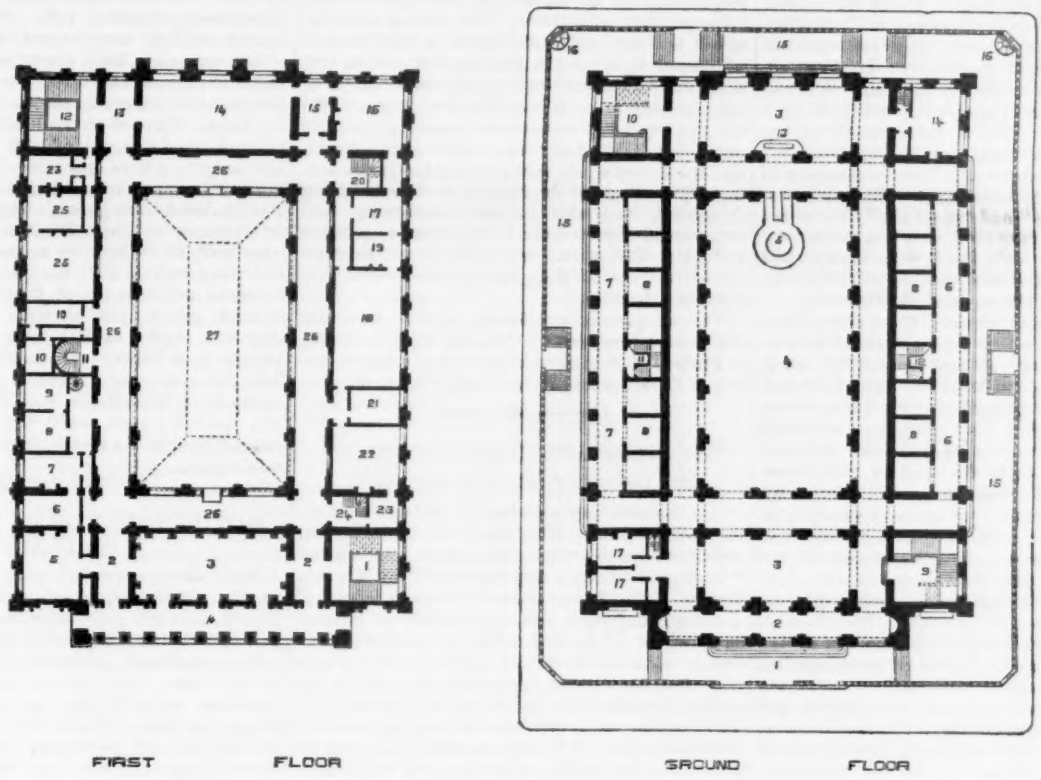
Ventilation at the Royal Institution.—Sitting among the audience when Professor Huxley was lecturing at the Royal Institution a fortnight ago, we were much impressed with the very defective state of ventilation of the lecture theatre, and somewhat surprised to find that those who undertake to instruct the public in the matters of science and hygiene should be so careless of the health and comfort of their members and friends. The draughts were frightful. There is another Royal Institute whose meeting-room is, to say the least, very inadequately ventilated.



THE NEW THEATRE IN DÜSSELDORF.—Professor Ernst Giese, Architect.



THE "PALAIS DE LA BOURSE," MARSEILLES.—M. PASCAL COSTE, ARCHITECT.



THE BOURSE, MARSEILLES.——*Plans.*

Ground Floor.

1. Principal entrance.
2. Porch.
3. Waiting-hall.
4. Grand hall.
5. Brokers' rostrum.
6. East portico.
7. West portico.
8. Brokers' offices.
9. Stairs of the Room of Commerce.
10. Stairs of the Tribunal of Commerce.
11. Stairs of the entresol supper floors.
12. Stairs of the entresol only.
13. Auction rostrum.
14. Brokers' settling-room.
15. Terrace.
16. Latrines.
17. Naval and commercial intelligence.

First Floor.

1. Stairs of the Chamber of Commerce.
2. Ante-room.
3. Grand assembly-hall.
4. Colonnade and balcony.
5. Ordinary meeting-room.
6. Library.
7. Principal secretary's room.
8. Assistant secretary's room.
9. Keeper of records.
10. Treasurer.
11. Housekeeper's stairs.
12. Stairs of the Tribunal of Commerce.
13. Vestibule.
14. Tribunal of Commerce.
15. President.
16. Hall of deliberations.
17. Judge's dressing-room.
18. Second room of the Tribunal of Commerce.
19. Hall of deliberations.
20. Record office or clerks' stairs.
21. Barristers' library.
22. Audience hall of creditors.
23. Creditors.
24. Stairs of committee of naval assurance and Lloyd's.
25. Syndicate of brokers.
26. Gallery.
27. Upper part of great hall.

X. Clock.

THE BOURSE AT MARSEILLES.

THE good people of Marseilles have for some time past, apparently, been troubled by the deficiencies of their city, one of the oldest in France (it claims a history of twenty-six centuries), in regard to public buildings, and especially those dedicated to the transaction of business. To quote from the address delivered by M. Fabricius Paranque, president of its chamber of commerce, on laying the foundation-stone of the "Palais de la Bourse," of which we now give illustrations,—"One would suppose that the business men of Marseilles, uncertain and fearful about their future, had, like travelling merchants, thought of nothing more than putting up their tents in a hurry, to take them down again the next day and pursue a new course of adventure. London, Antwerp, Odessa, Bordeaux, Nantes, Havre, all the great commercial cities, show with pride to their visitors the buildings which attest their wealth and prosperity. Marseilles, their fortunate rival, presents to the travellers who are attracted by its beautiful climate, its ancient origin, its admirable situation, and its commerce with all parts of the globe, nothing which in this respect is worth their attention. Cathedral, public library, palais de justice, museum, post-office, custom-house, bourse, tribunal of commerce, are all provisional only, are all yet to be built; everywhere there is an absence of grandeur and *éclat*; if it were true that the prosperity of a great city were to be judged of by its public monuments, Marseilles must at once resign itself to a descent into the rank of second-rate towns."

The "Palais de la Bourse," completed a few years since, must therefore, we presume, be regarded as the first decisive effort of the Marseillese to give to their city the outward aspect of a first-class commercial centre. The building was constructed under the auspices of the Chamber of Commerce, opposite the Place Royale, after the plans and designs of M. Pascal Coste, architect. The works were commenced in 1854, and finished in 1860.

The "*salle principale*," for the interchange of commercial transactions, comprises an area of 1,120 mètres, being considerably larger than that of the Bourse at Paris, which is only 1,020 mètres in extent. The ground-floor of the building includes a portico, two grand and secondary staircases, and offices in connexion with the business of the various commercial and maritime departments. The first-floor contains the Chamber of Commerce, with its accessory departments; the Tribunal of Commerce; the stockbrokers' exchange, &c. The second-floor is devoted to the record-office of the tribunal, the offices of the commercial agents, the maritime and insurance offices, Lloyd's agent, and the principal secretary of the Chamber; while the attic stage serves for the archives of the Tribunal of Commerce, and for living-rooms for various *employés*. Of the two principal floors we give plans.

The building is situated at the lowest part of the town, near the port, and the provision of a satisfactory foundation was a matter of some labour. A layer of ancient *débris*, 4 ft. or 5 ft. thick, was first penetrated, when a quantity of water from a hidden spring overflowed the site; this being eventually got under by pumping, a stratum of mud some feet thick was next penetrated, when a bed of clay was reached, which, with the assistance of a good deal of piling, gave a secure foundation for a first layer of rough concrete, upon which again a bed of cement concrete (the two concrete beds together forming a thickness of nearly 10 ft.), received the stone footings for the vaults of the basement.

The aim of the architect in regard to the principal front has been (we are informed) to give a monumental character by massing the decoration and reducing, as far as permissible, the size of the windows, "*nuisibles ordinairement à l'effet d'un monument.*" We do not hear how those who live and work in the rooms are satisfied as to the matter of light, which is an important consideration, though the remark as to the effect of over-large windows on a design of this character externally is true enough. The sculptured ornament has mostly been designed with direct reference to the objects of the building. The keystones of the large arches of the principal façade contain designs representing the attributes of Commerce, Navigation, Astronomy, Agriculture, and Industry. Under the tympana of the arches are sculptured the prows of vessels. Under the portico are placed, in niches, marble statues of colossal size, representing "France" and "Marseilles," by M. Ottin, sculptor. On the recessed portion of the façade are two bas-reliefs by M. Guillaume, sculptor (member of the Institute), representing respectively the genius of Navigation and of Commerce and Industry. Above the range of windows on the first floor, behind the colonnade, is a bas-relief above 80 ft. in length, representing "Marseilles" seated in the centre, receiving the peoples and products from the Mediterranean, and from beyond the ocean. On the right, arriving by way of the pillars of Hercules, are figures representing Africa, America, England, Scotland, &c., distinguished further by the presence of animals typical of the various countries. On the right, supposed to come by the Isthmus of Suez, are figures in like manner, bringing the products of China, India, Arabia, Egypt, &c. The whole is executed by M. Toussaint, whose name is a guarantee for the artistic excellence of the work. The statues on the recessed portion of the front on this level represent Enthymenes and Pitheas, names of

ancient Phocian navigators of the Mediterranean; these are by M. Ottin. Above the central colonnade the attic is ornamented with circular panels between the pilasters, inscribed with the names of celebrated navigators: La Pérouse, Tasman, Gama, Columbus, Magellan, Cook, and Durville; the centre panel being occupied by a clock face. The whole is surmounted by the arms of Marseilles, supported by the "Ocean" and the "Mediterranean." The two angles of the balustrade support winged children, representing "La Force" and "La Paix." These are connected by a range of antefixæ consisting alternately of a male head with an oak-leaf chaplet and a female head with an olive wreath. All this portion is the work of M. Toussaint.

It will be seen that no small thought has been given towards rendering the sculptured decoration appropriate, and giving it a distinct meaning in reference to the building. The back and side elevations are treated with more simplicity, not merely as being less seen, but as being devoted more to the mere practical business operations carried on in the buiiding, and, therefore, not calling for such decorative treatment. The great hall, before alluded to, repeats in its decoration something of the ornate character of the principal façade. The keystones of the lower arcade are inscribed with the names of the countries with which Marseilles has its principal commercial relations. The floor is paved with black and white marble; the ceiling is decorated very richly, including ten allegorical bas-reliefs, referring to different crises in the legendary, religious, political, commercial, and diplomatic history of the city. The subjects represented are "Commerce receiving the Plans of the Palais de la Bourse" (over the entrance), and opposite to this is "*La Justice Consulaire.*" The remainder, which follow historical order, are as follow:—"The Foundation of Marseilles"; "Marseilles Christianised"; "The Departure for the Crusades"; "The Re-union of Provence with France"; "The Capitulation of Francis I. with the Levant"; "The Chamber of Commerce paying [*soldant*] the Consulates and the Scientific Expeditions"; "The Conquest of Algeria"; and "France receiving the Trophies of Conquest in the Crimea and Italy." The artist, M. Gilbert, has kept his work in strict subordination to the lines of the architectural design, and has contrived to blend the whole into a harmonious unity of effect. The rooms of the Chamber and of the Tribunal of Commerce are also decorated with wall paintings.

All the ornamental carving was executed by Parisian ornamentists; that of the exterior by MM. Thiebaud, Corbel, and Cottebrune; that of the interior by MM. Baleitz and Armand.

The total cost of the building was 3,200,000 francs, and that of the site, including amounts paid in compensation to owners, 4,800,800 francs, making a total of above 8,000,000 francs (320,000*l.*), of which the whole, except a subscription of 600,000 francs from the town, was borne by the Chamber of Commerce of Marseilles.

M. Coste, the distinguished architect of this building, now in his eighty-ninth year, is a great lover of Egypt, and has recently prepared a charming set of drawings for a church designed in the Egyptian style, rather, probably, to show its adaptability than with any probability of having them carried into execution.

CONVERSION OF THE HOLBORN AMPHITHEATRE.

The present rage for skating-rinks in the metropolis has extended itself to the spacious amphitheatre in Holborn, which has hitherto been devoted to equestrian and dramatic performances. The interior of the building is at present undergoing a complete transformation, with the view of adapting it to the purposes of a skating-rink, and also for promenade concerts. The spaces under the boxes, formerly the pit, have been thrown into the "ring," and the entire floor is being laid with concrete, 12 in. in thickness, which will be covered over with Portland cement, forming the facing of the floor of the rink. It will be 70 ft. in depth, with an average width of 60 ft., and will contain a skating area of about 4,000 superficial feet. A skirting, 4 ft. in height, is carried round the rear boundary-wall of what was the pit, together with seats for the skaters. That portion of the stage at the north end, immediately adjacent to the ring, has been converted into a refreshment-bar, whilst on the remaining portion of the stage space at the rear, an orchestra has been erected, uniform in height with the boxes, and also having a frontage corresponding with them. The ceiling is being raised, and skylights introduced, in order to give additional light to the skating-rink below, and is also undergoing an entire re-decoration. For the purpose of rendering the building suitable for the intended promenade concerts, all the partitions dividing the boxes have been removed, and the entire space thrown open for promenading. The whole of the interior is likewise being decorated, and the pillars, cantilevers, and ornamental figures round the boxes re-painted and gilt. The works in progress are to be completed, and the building opened for its new purpose, in a fortnight.

The alterations are being carried out under the superintendence of Messrs. Furber, Price, & Furber, of Warwick-court, and the contractor is Mr. E. Lawrence, Wharf-road, City-road.

DREDGING AND HARBOUR WORKS.

THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting of the session held on February 8th, Mr. Geo. Robt. Stephenson, president, in the chair, the paper read was on "Carlingford Lough and Greenore," by Mr. Jas. Barton, C.E. It was stated that the mouth of Carlingford Lough was sheltered by a natural breakwater of rock, leaving a channel about 700 ft. wide. Across this channel a bar of blue clay and boulders had existed previously to the works described, the depth of water being only 7½ ft. at low tide. Within the Lough the water was more than 18 ft. deep at low water over an area of 1,200 acres, affording safe anchorage. Although the cutting of a channel for navigation through this bar had been recommended by the Tidal Harbours Commissioners and by the Refuge Harbour Commissioners, it had not been carried out as a public work, but was undertaken locally under the Piers and Harbours Act, and was authorised by Parliament in 1864 to be executed by a Board of Commissioners, for which purpose a sum of 80,000*l.* was lent by the Public Works Loan Commissioners on the security of expected tolls. The exposed position of this work was somewhat unusual for dredging. The number of days in the year when the weather permitted the dredging to proceed varied from a minimum of sixty-seven in the year 1871, to a maximum of 131 in 1873, and upon many of these days the work was limited to two or three hours. The materials raised per season varied from 50,000 tons to 99,720 tons; the clay was generally blue and plastic, with boulders embedded, varying in size up to 4 tons in weight. The dredging plant had been specially designed, and was constructed by Messrs. Simons & Co., of Renfrew: it dredged in water 35 ft. deep, and lifted stones up to 30 cwt.; the larger ones were chained by divers and raised by a crane on the vessel's bow. The average lift for all days on which the dredger worked, whether one hour or sixteen hours, had been 850 tons; the maximum tonnage raised in one day was 4,000 tons. Some rock inside the Lough had been removed by first blasting on the surface with dynamite, and then dredging the broken-up rock. The channel already formed was 18 ft. at low water of spring tides for a width of 300 ft., and a further width of 50 ft. at each side had been cut to a depth of 14 ft. at low water. The channel was intended to be 600 ft. wide, and 18 ft. deep at low water. The cost of the works, including insurance of plant and Parliamentary contests, &c., had been approximately 1s. 9d. per ton. The cost of the actual work for any one season varied from 1s. 4d. to 1s. 6d. per ton. Two leading lighthouses had been erected to guide vessels through the channel, which was about three-quarters of a mile long. Within Carlingford Lough a point stretched out to the edge of deep water from the south side called Greenore, and here, three miles inside the bar, a marine station had been constructed and a railway to it formed from the Irish North-Western Railway at Dundalk, and another was in process of construction from Newry. This point afforded special facilities for a fixed hour steam service to Holyhead and elsewhere. The works at Greenore had been designed to provide for the convenient loading and unloading rapidly of steamers, with passengers, cattle, and goods, and to provide for the necessities of each kind of traffic. The front of the land end of the wall below low water was formed of concrete blocks of about 3¼ tons, set by divers, and the back face of the wall had been formed of concrete in sacks, containing about 1 cubic yard each, put down soft, and built in courses; and the hearting was of concrete deposited soft. The foundation at the sea end had been formed of concrete blocks of 100 tons each, built upon the beach above low water in frames, and lifted, carried, and lowered between two barges by special machinery worked by hand. Two of these blocks, one upon the other, formed a length of 10 ft. of the wall up to low water. Above low water the wall had been built of heavy rubble limestone masonry, and it was fendered throughout. The cost of the works at Greenore had been 130,000*l.* The cost of the quay wall, 45 ft. high on an average, had been, including extras, 27*l.* 8s. per lineal foot. The concrete used was one of Portland cement to six of sand, gravel, and stones. The cost of the concrete blocks of 100 tons each, when set, exclusive of barges and machinery, had been 30s. per cubic yard. That of the concrete built in the back face of the wall in sacks had been 23s. per cubic yard, while the cost of the liquid concrete set in the foundations had been 18s. per cubic yard.

THE DEGRADATION OF THE PAINTER ON GLASS.

Sir,—Recent events having directed attention to the above important subject, I take the liberty, through your columns, of adding to the material for forming conclusions thereon a few reflections from a workman's point of view. As far as I have been enabled to gather, from expressions in public journals and other sources, those who have at heart the renaissance of art in England are persuaded that the two great levers to move to that end must be the education of workmen to produce art-work, but primarily, a much more urgent measure,—the education of public taste to create a demand for the same. In reference to the art-education of the workman, a great outcry has been raised of late concerning his technical instruction, doubtless a great desideratum, and which, when attained, will result in his and his country's benefit; but at present the main result has been the providing a cant phrase and rallying-cry for a handful of persons, who, self-appointed and self-accredited with superior attainments, set themselves on high to teach and raise to their standards their fellow workmen. For the comfort of the working-man patrons in a higher sphere, for whose motives one must perforce entertain the profoundest respect, I would humbly suggest an entirely new and much more promising field for a missionary enterprise of an æsthetic kind, namely, their own saloons, drawing-rooms, and clubs, where they could instruct their equals in the primary elements and ethics of fine art, educate their eye to detect at a glance the pure gem from the *Brumma-gem*, and teach them how nobly and wisely to expend the wealth they are so ready to lavish uselessly at the dictate of fashion. There can be no vigorous permanent reaction in an art direction until we "reform this altogether." This brings me back to the consideration of the question that when this general demand for real art in the homes, the churches and private chapels, and public halls of the richest aristocracy on earth is made, is the English workman capable of meeting that demand? Has he, since the establishment of Government schools, and the impetus given to other schools of art, sufficiently availed himself of such opportunities of improvement in his general art-training as to compete successfully with the Continental workman in his own branch? In stained glass, for instance, is the present alleged low ebb of its art element to be attributed to the workman's inability to produce better work, the absence of any demand for a higher class, or the incapacity of the draughtsman to design it?

On this head some light should be thrown by an important statement of a great authority on the subject given recently in a court of justice. This was in an arbitration case on a dispute as to the price of some fine-art work on glass, between Lord Beaumont, customer, and Messrs. O'Connor & Taylor, producers; heard before Sir Frederick Pollock, at his Chambers in Chancery, at the Court of Common Pleas, verdict being given on the 28th of January last. At the previous hearing, on the 20th, the witness in question affirmed on oath that in the execution of a stained-glass window the design and drawing were the main predominant consideration,—so much so, as to comprise half the cost of the whole; thus the other half includes collectively cutting, glazing, firing, fixing, cost of material, profits, and painting. He further laid it down

as his solemn dictum that glass-painting in itself was the merest, most mechanical of operations, requiring no art-knowledge whatever, and for which the lowest order of intelligence amply suffices, as it consists simply of the transference of the pattern on to the glass. Further, that a highly-finished piece of work shown in Court he would have given to boys or improvers to do (although he declined to name the price at which such mechanism should be paid). These may not have been that gentleman's precise words, but they are undeniably the substance of his remarks, and are completely consonant with his favourite axiom, of "the bigger the fool the better the glass-painter." This delicate sentiment has all the more weight when we consider that, though we gladly acknowledge our censor to be a splendid draughtsman (as far as such mechanics may presume to judge), still this severe critic of the art of glass-painting has not succeeded yet in painting one square foot of glass. And, for all he has proved to the contrary, cannot do so.

On which side this evidence referred to was given is, I am constrained to admit, rather vague, for all that can be learned from every source leaves the absurd, painful, and confused idea that at different periods of the case it was given in favour of both. Perhaps it was this too subtle refinement of truth that closed the sight of justice. Be it as it may, after a long poise of the scales,—eight days' consideration,—Sir F. Pollock gave judgment directly in the teeth of this evidence, the acknowledged position of the witnesses notwithstanding.

Now, Sir, being but one of these mere mechanics, it cannot much matter what my opinion may be, save and except as affording a still further illustration of that bitter class-feeling which exists; for to affect to feel insulted by the remarks referred to would be the height of ludicrous vanity and presumption. Therefore, from the vantage-ground of our utter insignificance, I take upon myself, in the name and with the concurrence of the main body of glass-painters (what few there are of us), and especially of the extra skilled hands and figure-painters, to deny simply the very essence of the statements referred to; and confidently challenge both him who uttered and those who coincided with them to substantiate their truthfulness. I am happy to think that not the workmen alone, but many employers, are fair and honourable enough to agree with Sir F. Pollock and a Royal Academician who gave evidence, in refusing such statements as being as mischievous as false, and as injurious to the workmen employed as they are dangerous to the present and future prospects of the art of glass-painting. For consider, Sir, a moment: stained-glass windows, not being a primary necessity of existence, are a luxury, or nothing; and if a luxury, their very existence must depend on the art-element retained in their composition and treatment. Had the startling anomaly been predicted of an attempt to restrict, to debase, and degrade, or altogether exclude, such element, it would have been ascribed to some soulless dealer or manufacturer ignorant of the very nature of the art by which he lived; but the man's sanity would have been seriously questioned who prophesied that the deadly blow would have been aimed by the very arm which should most have shielded her from such an attack. That not only the largest manufacturer of this class of goods goes out of his way to cry down his own wares; but he who is loudest in detraction and scornful denial of the existence of an art element, is the very man accredited with being *the first artist in its production*. And for what object are these statements uttered? What is the aim and end of such stultifying policy? Simply to take the last vestige of credit that might possibly still appertain to the *painter* in order to add a little more honour and glory to the inordinate claims of the *draughtsman*. No glass-painter wishes to claim any sort of share in the honours justly due to a good draughtsman, or underrates a good design for glass (a good drawing is much too scarce an article in most establishments not to be fully appreciated); but this design, however artistic and original, has to be got on to the glass somehow. It cannot be printed,—at least they do not print figures yet. The system pursued by some manufacturers, interested in sacrificing any art-element to the commercial consideration, has been pretty successful in eliminating any trace of a mind in a workman's work. By a combined method of ultra-subdivision and unremitted snubbing he is pulled down to as low a mechanical level as is compatible with being human at all; but, unfortunately, when as much individuality as dare show itself is carefully ground out of him, there still remains an awkward sediment, a *residuum*, that deludes him with the idea that he could distinguish his own copy from the other school-boy's; which reminds me respectfully to inquire as to what is mere reproduction? A translator or an actor merely reproduces the original poem or the playwright's text? An engraver reproduces; and yet is conceded to be an artist, and takes academical rank with the painter, whose picture he merely reproduces. Without multiplying instances, a dozen analagous occupations must suggest themselves that are neither pure art nor simple manufacture, but art-ware, wherein the manufactured article depends entirely for its value on the workman's ability to merely reproduce the original design on the final material. As in glass-painting, for instance, it may be pertinent to point out that, after all, the customer buys the glass and not the drawing. He gets the essential material, just as the workman leaves it; something specially done for him, and which cannot be used again for another customer. Whereas, a drawing, if considered good, *i.e.*, although incorrect in anatomy, disproportioned, artificial, and strained in pose and utterly void of expression, yet in strict conformity with some shadowy standard of style, is used for as many windows as it will fit up to twenty or thirty on a fair average, or may be the said drawing is a bare, bald, reduced, or enlarged copy of one of those Mediæval ideals by a draughtsman apprentice or improver, in which case the drawing is used just once,—too often, in short,—irrespective of the fact that to successfully reproduce a good design requires skill, knowledge, long practice, and some art-knowledge and feeling for what beauty the design may possess. So, conversely, a bad workman can spoil, for all art purposes, the best design, by simply *copying* it, mechanically and lifelessly, independently of such self-evident truth, whosesoever interest it may be to deny it. It is notorious that the best hands in many glass-painting establishments are much more frequently occupied in supplementing the inefficiency of the professional draughtsman, by putting on to the *glass* the art element that alone gives it its value, and which it possesses in exact proportion as the drawing is ignored and departed from. On the other hand, a figure drawn carefully from life or a portrait (often painted on glass from a small *carte*, or an enlarged drawing, *not safe to follow*) makes separate calls on the ignorance and incapacity of the painter, the reproducing machine. Whilst the best specimen of any period of old glass is justly admired for its mere manipulation, the same generous critics and artist-employers coolly tell the world no modern workman could produce such work; and they take care that, under the grinding and soul-slaying system they adopt and would justify, he never shall. Surely the eminent contractor for this class of goods (for as all the art is in the drawing, and the public only get the glass, this is the right term), and those who abet him, cannot have considered what the ultimate tendency must be of their own teaching; for from the prestige attached to their names and positions, only too many would be glad to credit their allegations, which, in my presumptuous estimation, simply aggravates the injury. We sincerely hope they will reconsider their position, not under any such pressure as the protest of the workmen aggrieved, but as the result of their own deliberate conviction, based on something a little nearer to truth and justice than the dictum complained of, otherwise their conduct will bear the unfortunate construction of taking the opportunity referred to to offer a gratuitous insult to a class of men whom they consider it quite safe to treat with open contempt; and that in defiance of all modern movement towards art education, against the strivings of national art-teaching, in mockery of the efforts of all enlightened patrons, in derision of the workman's struggle for self-improvement, and directly contrary to every recent expression of imperial policy.

A GLASS PAINTER.

Fine Art at Cambridge University.—The Slade Professorship of Fine Art at Cambridge having become vacant by the expiration of the three years for which the appointment is made, a meeting was held on the 12th inst. for the appointment of a successor to Professor Colvin. Professor Colvin, being eligible, was re-elected without opposition.

UNHEALTHY OCCUPATIONS.

DR. RICHARDSON delivered the concluding lecture of this series on the 4th inst. He said that it was his intention to consider that evening the remedial measures which might be adopted to check the apalling number of deaths resulting from the unhealthy occupations he had described in his previous lectures. He would repeat what he had before said on this point,—that many of the diseases could be arrested by science if she was assisted by a wise legislation, and others by science unaided by any legislation at all. From various sources it had been shown that the abridgment of the hours of labour had not had an entirely beneficial effect on the working-classes, for it had frequently led to more drinking and to such pursuits as pigeon-flying and dog-racing, and it was certainly not always conducive to an increase of home comforts. He had shown in his preceding lectures that the death-rate among the five millions of the working classes was at an appreciable increase over that of the ordinary population of England, and in view of this he considered that there should be a Minister of Health added to our Government, with a seat in the House of Commons, in order that he might always answer questions pertaining to his department. He submitted that at the present time all matters connected with the public health were in a most chaotic state. There were now distributed over the country 900 duly appointed factory surgeons, but their duties and powers were of the briefest and most unsatisfactory nature, and their chief work seemed to be the examination of the younger workers in order to see if they were old enough to be allowed to enter a factory. They had no power to look into such matters as the ventilation of workrooms, the proper clothing for the persons engaged, and their protection from disease in other ways. He would wish to increase the powers vested in the hands of these medical officers in order that matters of so much importance as he had named should receive due attention. He also would suggest the extension of the Bill for the construction of healthy homes for the working classes, and, again, he would like to see instituted a perfect system for the registration and comparison of the different descriptions of diseases by which the working classes were afflicted. He was satisfied that the results of such a system of registration would be most useful, and that no more difficulty would be experienced than in the compilation of the ordinary tables of mortality. Then science could do much for the health of the working classes if the men and women engaged in unhealthy occupations would but consent to use the protective appliances with which they could be supplied. He regretted to say that in many cases the workpeople were utterly neglectful of their own healths and lives, and had refused to wear the masks which had been constructed to prevent the inhalation of the dust and other substances which were so prejudicial to their health. Many ingenious inventions had of late years been made for the improvement of these respirators or filters, and their use had been invariably attended with beneficial results. It seemed at first sight to be a simple matter to make an efficient mask to exclude the dust and yet be thoroughly wearable and reliable, but it was a more difficult matter than it appeared. For not only must there be provision for free admission and for free expiration of air, but the mask must be of such materials as would not permit any accumulation of the moisture, as this rendered the appliance nearly useless. Very many respirators have been made with cloth, crape, and cotton wool as the filtering medium, and were in actual use among workers with good effects, but they would be found useless in many factories. After long research he (Dr. Richardson) had found that the most perfect filtering appliance that could be used was feathers, provided the feathers were not made into the form of a mat, as, if they were so used, they arrested the moisture which was expelled in the breath, and became useless. He had therefore constructed a mask in which the feathers were placed loosely around a tube pierced with holes for the admission of air, the mask being also provided with valves which allowed a free passage for the expiration of the breath, and had found this form to answer very well indeed, as it arrested the finest dust, and yet did not allow any moisture to remain on the respirator. Dr. Richardson then demonstrated the successful nature of his appliance by a conclusive experiment with corn-flour, and said that he hoped to see feathers soon

largely used as respirators by workers in factories where dusts were found to be injurious to health. He would further say, in concluding his remarks on the subject, that the question was one of truly national importance, and deserving of the closest attention, for how to render the lives of industrious toilers in our great country more healthy and more real was a matter which should be of absorbing interest to all. He considered that the whole of the industrial class was physically, and therefore morally, unhealthy, and in this state it existed, as rich men commonly existed, reckless about itself and mistrustful of all connected with itself. Greater attention should speedily be paid to the external conditions of its existence, and if the Society of Arts could succeed in opening the eyes of the Government on this important subject, it would, he thought, add to the number of those great works for which during the last century it had laboured with such entire devotion.

Mr. Benjamin Shaw (the chairman of the meeting), in presenting a cordial vote of thanks to Dr. Richardson for his interesting and valuable course of lectures, said that he must differ on one point with the worthy lecturer, for he considered that the governmental department which regulated matters pertaining to the national health had of late years effected much for the general welfare. The voice of public opinion must always guide all such reforms, and the intelligent classes should bring all their influence to bear on the commencement of further sanitary reforms, for the carrying out of which an administration already existed.

DOMESTIC CHAPEL, WYNNSTAY.

SIR WATKIN W. WYNN has recently built a Domestic Chapel adjoining the pleasure-grounds attached to his principal seat, Wynnstay, North Wales. Divine service previously had been performed in a building not specially adapted for that purpose. The chapel which takes its place, though it occupies the site of an older edifice, is practically new; but the south façade of the latter, though much altered, was considered worth preservation owing to its being of some architectural character (Italian in style), and executed of the freestone quarried in the park. A new north aisle and organ-chamber have been added, opening out into the nave through two bold and handsome arches. At the east end of the aisle the organ will be placed. Beyond, further north, is a lean-to vestibule leading to a porch, the entrance for the tenants and the servants, the private doorway being on the south side in the pleasure-grounds. The windows of the principal front are two-light and semicircular-headed, designed rather in the Veneto-Italian type. At the west end of the nave is a circular window filled with tracery of somewhat similar type, but the east wall contains no window, as the reredos—an adaptation of an old one—occupies the whole end. Externally the roofs are covered with slates, and internally these are ornamented with plaster ceilings divided into panels by richly-moulded ribs, also of plaster. There is a deep cove extending from the cornice to the soffits of the collar-beams. The nave and aisle are seated with ordinary chairs. The south entrance has handsome moulded solid oak doors. The windows are glazed with cathedral rolled glass of different tints in ornamental lead quarries intermixed with clear white glass. The passages are paved with encaustic tiles. The chapel is heated by hot water. The architect was Mr. Edmund B. Ferrey. The lighting is by sun-burners.

THE BRITISH AND AMERICAN ARCHÆOLOGICAL SOCIETY, ROME.

ON the 27th of January the Society made an excursion to the Ghetto. The remains of the Theatre of Marcellus were first examined, but owing to the water, the Society were unable to visit the chambers under the theatre, which Mr. S. R. Forbes considers are the remains of the Decemviral prisons, built by Appius Claudius, and the scene of Roman charity, as recorded by Pliny. The ruins called the Portico of Octavia, and which Mr. Parker calls the Porta Triumphalis, were then visited. Mr. Parker thinks the Portico of Octavia was to the right, and the Portico of Philipius to the left, of this ruin, which is where the triumphal processions entered the city according to Mr. Parker's theory. One column still stands amongst the houses, supposed to be remains of the Temple outside the city where the General asked the triumph of the Senate. Passing up the piazza di S. M. del Pianto, in which is a house with the following curious Mediæval inscription, which was spoken of:—VRBE · ROMA · INPRISTINAM · FORMA · ENASCENTE · LAVR · MANLIVS · RARITAE · ERC · A · PATRI EDIS SV · NOMNE · MAN II AN · AS · PRO PORT AR · MEDIOCRITAE · AD · FOR · IVDEOR SIBI · POSTERISQ · AB · VRB · CON · M · M.CCXXI · L. AN · M · III · D · PRI · CAL · AVG. In the course of the promenade the two travertine Doric columns supporting an architrave of the first century, and thought to be the remains of the portico of the Theatre of Balbus, were visited, under the guidance of Mr. Forbes, also the remains of that theatre, so that the whole circuit of it was traced. The object which next attracted attention was the reputed house of St. Paul, No. 2, Via degli Strengeri, which, according to Jewish tradition, was the hired house of Paul. The house itself has been rebuilt, but the cellars are original work of the first century. The Roman Catholic church points out yet another site, the church of St. Paolo della Regola, which is close by,—this church was the site of his house; and a chapel adjoining, but of a different period, is said to have been where Paul had a school. The so-called house of Rienzi was then visited. Moral from the inscription:—

"In fair places remember even the sepulchre."

On Friday, February 4th, Mr. S. Russell Forbes read a lecture, written for the Society by Signor Visconti, on the Thermæ, with additional notes by Mr. Parker and Mr. Forbes, bringing the lecture down to the present state of the ruins.

HEALTH IS RICHES.

FOR THE USE OF SCHOOL BOARD SCHOOLS.

WORK and think while you're at school,
Do the same at trade and college;
Feet keep warm and head keep cool,
March athirst and master knowledge.
Strive not too much after gain,
Gold may build up empty niches;
But the statue is the brain,
Health with it is best of riches.

Clean in person, clean in dress,
Clean in thought, and word that's spoken,
Education 's cleanliness,
Health the outcome sterling token.
Onward each aspiring soul,—
Life 's a ship that often pitches,
Though in wealth you may not roll,—
Health to man is always riches.

A SEWERAGE DILEMMA IN TORQUAY.

WE learn from the *Western Daily Mercury* that at the monthly meeting of the Torquay Local Board, on the 4th inst., a discussion took place on the high level sewerage scheme. It appears that some eight or nine months since the Local Board advertised for tenders for the construction of what is commonly known in Torquay as the "High Level *Blunder* Scheme." Messrs. Bell & Co. sent in a tender amounting to 43,000*l.*, whilst the highest was nearly double that amount. The Board accepted Messrs. Bell's tender, although it was generally surmised that the work would not be carried out by them for that amount, and certain events which have recently transpired prove that surmise to be correct. At the Board meeting on the 4th inst. the clerk stated the position of affairs. He said that he had received a letter from Sir Joseph Bazalgette stating that the contractors had done 14,000*l.* of work in connexion with the undertaking, and that he was of opinion they were losing money by the transaction, and suggested that they should terminate their contract. In pursuance of this the Main Drainage Committee recommended "that notice to determine the contract be served on the contractors and Sir Joseph Bazalgette be recommended to make such alterations in the drawings as experience shows to be necessary." The clerk saw Messrs. Bell, and they said that they were not desirous of making the sum asked for extras a hard and fast line, and they would revise their figures. The clerk telegraphed to Sir Joseph, who did not advise any delay. Meantime Sir Joseph had an interview with one of the Messrs. Bell, and then wrote, "I recommend you to determine your contract forthwith." He subsequently telegraphed; "Contractors have seen me; they promise no alterations I could recommend. Please serve the notice." There was the matter at present. Mr. W. Bridges said a more unfortunate position of affairs could hardly exist. It seemed to him an extraordinary state of things that the tender which was sent in for 43,000*l.* and then cut down to 38,000*l.* should be increased to 72,000*l.* He thought that Sir Joseph Bazalgette was somewhat to blame for not examining more strictly the calculations. He moved that a notice upon the contractors to determine the contract be served. This was carried unanimously.

LIGHT AND AIR CASES.

CLARK *v.* WATERLOW AND ANOTHER.

THIS was a claim (Common Pleas Division) for obstruction to light and air; also for an injunction against the injuries complained of.

The plaintiff was a greengrocer, and the defendants the well-known firm of wholesale stationers. In March, 1874, the plaintiff bought a thirty years' term in two houses, Nos. 12 and 13, South-street, Finsbury. These houses were over fifty years old, and until recently had enjoyed an unusual amount of light, owing to their being opposite to the old structure of Finsbury Market, which was only 25 ft. high. Some years before the plaintiff's purchase, the defendants bought the market, and erected upon its site a warehouse 65 ft. high, at a distance of 38 ft. from the plaintiff's frontage. For the loss in the value of the plaintiff's property occasioned by this building the plaintiff claimed 165*l.* The defence was that the plaintiff knew what was going to be done, and bought the property with his eyes open, and that the value of the property was not in reality diminished, the light being still amply sufficient for all practical purposes—a fact that was shown by the plaintiff having raised his rents since the completion of the defendants' building.

The jury found a verdict for the plaintiff—damages 100*l.*

ASSESSMENT OF BUILDINGS.

THE CORPORATION OF THE HALL OF ARTS AND SCIENCES, KENSINGTON GORE, APPELLANTS, AND THE ASSESSMENT COMMITTEE OF ST. GEORGE'S UNION, RESPONDENTS.

MR. POLAND and Mr. Besley appeared for the appellants, and Mr. F. M. White and Mr. Castle for the respondents.

This was an appeal (Court of Assessment) by the corporation of the Albert Hall against the valuation list approved by the respondents, in which the Albert Hall had been valued at 12,000*l.* gross value and 10,800*l.* rateable, and the Court was asked on behalf of the appellants to reduce the gross value to 1,500*l.* and the rateable value to 1,250*l.*

It appeared that the appellants were incorporated by Royal Charter, and the purposes of the corporation were therein stated to be the building and appropriation of the hall to the performance of music, and generally for any purpose connected with science and art. It was contended by the appellants that, these being the only purposes for which the hall could be used, the building was exempt from rateability under the statute 6 & 7 Vict., cap. 36, and it was proved that, in accordance with that Act, a certificate of a barrister had been obtained. A long argument ensued with regard to this point, and it was ultimately decided by the Court that the building was liable to be rated. The further question before the Court was in what mode the value should be estimated, whether it should be calculated according to the structural value or to the receipts and expenditure. It was urged that the building was totally unlettable, and that therefore the rateable value was *nil*. To support this view Mr. Ryde, the surveyor, and Mr. Cole, the manager of the hall, were called as witnesses. The latter proved that the enterprise had been unsuccessful, and that, in fact, the total expenditure from the 29th of March, 1871, when the building was opened, down to the present time, had greatly exceeded the receipts; that is to say, that the expenses had been 35,603*l.* and the receipts 33,076*l.* The last year had been worse than any of the other preceding years. The original members had appropriated to their own use 508 stalls, 33 boxes on the second tier and 31 on the first, and they possessed the right of disposing of their seats as they chose. The stalls, which were originally bought for 100*l.*, now sold for 40*l.* Mr. Robert Vigers and Mr. Charles Lee (surveyors) were called by the respondents to show what they considered should be the proper value of the property, and the result of the case, which lasted the whole day, was, that the Court adjudged that the figures in the valuation list should be altered to 5,000*l.* gross and 4,160*l.* rateable value, and no order as to costs.

MIDLAND RAILWAY COMPANY *v.* ST. PANCRAS.

The appellants in this case were the Midland Railway Company, and they are in the possession of large premises situate in the Euston-road, and amongst them is the Midland Grand Hotel, of which the Company are both owners and occupiers. The hotel premises are not yet completed, nor is the hotel fully furnished; but the hotel has been opened for business since the 18th of May, 1873, and large sums of money were still being expended in completing and furnishing the hotel premises. The appellants contended that the working expenses necessary to carry on the hotel business were large and constantly increasing, and that large deductions must be made from the gross receipts before estimating the assessable value of the premises. At first

the Assessment Committee, on the 18th of June, 1875, assessed the premises at 8,000*l.* gross and 6,667*l.* as the rateable value; but subsequently, on objection being raised by the appellants, reduced the gross value to 4,200*l.* and the rateable value to 3,500*l.* The appellants, however, still felt aggrieved at this amount, and contended that the sum of 4,200*l.* greatly exceeded the true gross value of the hotel premises, and that it ought to be reduced to 1,066*l.* They further contended that the sum of 3,500*l.* greatly exceeded the true rateable value of the hotel premises, and that it should be reduced to 889*l.*

It was agreed that the appeal should be withdrawn without costs, that the gross value should be taken at 4,200*l.* and the rateable value at 3,500*l.*, and that these amounts shall be continued until 1880 without being disturbed.

IS A RINK A HOUSE?

GILLETT *v.* DAN.

THIS action, before Vice-chancellor Sir Charles Hall, in the Chancery Division, raises the rather curious question whether a skating-rink is a "house." The plaintiff had purchased a plot of building-land in Newton-road, Faversham, which, with the adjoining plots, was subject to conditions that the purchaser should build "houses" thereon, and which prohibited the building of "any shop, warehouse, factory, or building of a similar character."

The plaintiff had built a house on his plot, and finding recently that, on an adjoining plot which had been purchased by the defendants, a board had been placed, bearing the words "Faversham Skating Rink Company, site of rink," and that shingle was being carted and spread on this site, he issued his writ for an injunction to restrain the defendants from erecting the skating-rink, or any other building which was not in accordance with the conditions under which the plots were held.

Mr. Dickinson, Q.C., and Mr. Whitehorne, for the defendants, contended that, inasmuch as any room in a house might be used for the purposes of a skating-rink, and as there was no evidence of any intention to transgress the conditions, the motion must fall.

The Vice-chancellor then directed the postponement of the motion in order to give the plaintiff an opportunity of producing further evidence.

THE ROYAL AQUARIUM, WESTMINSTER.

YOUR correspondent "Truth" is wrong in supposing it is the large cost of the sea-water that prevents the tanks being filled. It is that they are not perfectly water-tight and leak, among other places, at the point where the glass joins the frame work.

Surely some of your readers will be able to instruct the parties concerned how to construct a water-tight fish show-tank as at other aquariums. The difficulty at Westminster appears to be fixing the glass perfectly rigid, so that when the weight of water (two tons) comes against it, and the glass having to contend with cold water on one side and a warm atmosphere on the other, it gives way, not being able to expand. Or has the vibration of the Underground Railway, which passes under the building, anything to do with the breakage of the glass? SEA WATER.

KNIGHTSBRIDGE BARRACKS.

LONG in a state of decay, this antiquated caserne has now become so ruinous that demolition and rebuilding are said to be the only alternative. It might have suited the halberdiers of Queen Anne's reign, but affords scant accommodation for 400 of her Majesty's Life Guards, with their officers, horses, and equipments, the principal fault being that all the chambers and compartments are too low by 2 ft. at least. It occupies the whole park margin between the park drive and the Kensington high road, extending a quarter of a mile and 35 yards over between the Duke of Wellington's stables and Prince's Gate, the entire length being 1,425 ft., and the width being for one half of its extent, 195 ft., which is reduced, by a slight divergence of both the outer road and the inner drive, to only 90 ft. at the western extremity.

The drill-yard within the barrack block is much restricted, on account of the narrow and elongated site originally chosen, and both the Kensington-road and the fashionable park drive are marred, obstructed, and disfigured by the obtrusion of old unsightly walls and windows along the verge of either side, exhibiting the varieties of troopers' toilets to the passers by on the road or the drive.

A quadrated block of equal dimensions, but nearer to a square, would give more room for the erection of a barrack more conformable to the taste of the day, and more commodious for the requirements of the regiment of Royal Horse Guards.

It is hardly requisite to state how ornamental it would be to the Park, and what a solace to passengers, both on the road and the drive, if this border of *over one quarter of a mile in length* were planted, shrubbed, and railed in; and it might suit the taste and interests of the public if the Park Ranger would concede a plot of nearly similar extent, within the Park, opposite to the present structure, and nearly upon the site of the Exhibition of 1851, the ground here being higher, more open, and not 100 yards from the present tottering structure.

A building in accordance with modern requirements, and presenting a fair architectural aspect, if properly quadrated, or nearly squared, might well be tolerated in this position, if given in exchange for a long, shrubbed border, of nearly the same dimensions or contents.

Two sites for the erection of new barracks were suggested in the *Builder* some years back; one near the Ranger's Lodge and the old Guards' station; the other within the old Palace gate, Kensington (where an old and unused Guards' barrack now serves for stables). The former, although newer, might prove too rusticated; the latter might be too distant from town, although nearer to the Palace.

There are localities, such as Chelsea, where the Foot Guards Barracks have been for years established, and where room could be obtained for transfer of the Knightsbridge squadrons, but the expediency of selection rests of course with the authorities at the Horse Guards. One point, however, ought to be considered, and it is this,—that if the present old buildings should be thoroughly repaired, they must be vacated by the troops; whereas, if new barracks are constructed, as herein suggested, they might continue to occupy their old quarters until all should be put in order for their entering upon possession of the new.

The promenading frequenters of Hyde Park cannot fail to be grateful to the Ranger and managers for the wondrous improvements effected, first by the demolition and removal of the old decrepit guard-house at the Kensington angle, and then for the tasteful planting and floral ornamentation of that lovely and apparently sequestered nook. Similar floral and shrubbed ornamentation might be carried out along the site of the present barracks, lending a grace to the park, the drive, and the main Kensington road, which is the principal Boulevard of West London. QUONDAM.

WATER FOR HASTINGS.

I TRUST, for the sake of the dwellers in St. Leonard's, that the Sanitary Authority of Hastings will not be allowed to pursue the unworthy expedient of robbing St. Leonard's of its good water, to supply Hastings with water, without your influential protest. The Hastings water is most deficient in quantity; it is also quite unfit for drinking; it is thick and filthy to the palate. All over the Hastings district it is the same; every man, woman, and child in Hastings knows it to be as I describe it. No filtering could make such water wholesome.

Pray call attention to this state of things.

INHABITANT.

DEVIL'S-ALLEY, BETHNAL-GREEN.

IN the Bethnal-green Vestry, the Works Committee reported that they had inspected the Devil's-alley, Cambridge-road, and had instructed the surveyor not to take any steps at present with regard to the reopening of the alley; and the Clerk read an application to the vestry not to reopen the same, in the interest of morality.

Mr. Jacobs described the alley as a filthy, wretched place, and unfit for habitation; it had been the residence of many a fallen angel, and had been an eyesore to the Sanitary Committee for more than two years. If it remained closed, public decency and morality would be promoted. At the same time that he was not in favour of giving up right of public way, yet this was an exceptional place which should not be confounded with the open spaces question, and the closing of which would result in the public welfare.

A long and lively discussion followed; and ultimately an amendment to the adoption of the report that the Clerk take the necessary legal steps to compel Messrs. Mann and Crossman to reopen and restore the right of way, was negatived, having only three supporters. The report of the Committee was then adopted, by twenty to three against.

From its name the above place would seem to have been the abode of a fallen archangel, as well as one of the lower order. Dirt and indecency have long been its normal condition, and, like Thorold's-square, it ought to be improved away.

CHURCH-BUILDING NEWS.

Malvern.—Christ Church, Malvern, which has been erected as a memorial of the late Rev. Geo. Fisk, LL.B., Vicar of Malvern, on a site given by Lady Emily Foley, was consecrated on the 28th Dec. The building has cost between 7,000*l.* and 8,000*l.*, and is substantially built in the Decorated style. It is constructed to seat upwards of 700 persons, and has a chancel 33 ft. by 22 ft.; chancel aisle, 33 ft. by 13 ft. on the south-east; organ-chamber, 15 ft. by 13 ft.; and vestry adjoining, 15 ft. by 13 ft. on the north-east; nave, 93 ft. by 25 ft.; north and south aisles, 63 ft. by 12 ft.; south porch, 10 ft. by 9 ft.; tower in centre of west front, 21 ft. by 21 ft., and 76 ft. high to the cornice, with broach spire, 92 ft. high. At the east end of the south aisle a small turret is introduced, 8 ft. by 8 ft., 40 ft. high, surmounted by a small stone spire, 20 ft. high. There is a narthex behind the porch. The warming is effected by Haden's apparatus. Provision is made in the chancel for thirty-two choristers. The walls are built of the local stone, lined with brick, and the external facing of Cradley stone, pitch-faced, squared, and coursed. The dressings are of Bath stone. The roofs are open-timbered to the apex, and the benches are of pitch-pine, varnished. The reading-desk is of oak, the pulpit of pitch-pine, and the font of Caen stone. The several passages and floors of the tower, porch, and chancel are of pattern tiles, those in the chancel being of a richer pattern. The roofs are covered with Broseley tiles in bands of varied colour. The gasfittings are by Messrs. Sparks, of Malvern. The architects were Messrs. T. D. Barry & Sons, and the contractor was Mr. Hugh Yates, all of Liverpool.

Ebchester.—In the ensuing spring it is intended to proceed with the restoration of Ebchester Church, co. Durham, designs for which, by Messrs. John Smith & Son, architects, Shotley Bridge, were prepared some two years ago. The church is small, consisting of nave and chancel of about equal length, and is of the earliest type of Norman. The original windows vary from 5 in. to 8 in. in width, splayed to a considerable width on the inside, and are from 2 ft. to 4 ft. high, with plain semicircular heads, and the glazing close to the outer face of the walls. Owing to the deficiency of light obtained from the original windows, others of the common sash pattern have been inserted both in the east end and other places, thus considerably damaging the walls, and rendering "restoration" in the strict acceptation of the term almost impossible. On account of the nature of the ground on the south side the original porch and entrance have been removed, and a doorway of later date placed in the west end, and, from the style of the bellcote and coping on the west gable, these features seem to have been renewed at the same time. The foundations of the old porch were discovered recently while excavating on the south side. The rude Norman font at the west end, the chancel arch (also unmistakeably Norman), a recess, and a small safe in the east wall, are the only remaining features worthy of mention. The east end seems to have been rebuilt from the window-sill at the time the present sash-window was inserted. The nave and chancel are filled with pews of the well-known high straight-backed type. The church is dedicated to St. Ebba, a daughter of Ethelfred, king of Northumberland, the story of whose life contains many interesting features, which, with other historical associations of the place, have been embalmed in song by Mr. Lax, a local poet.

Plymouth.—Christ Church, Plymouth, was opened on the 9th ult., after restoration. The Caen stone used in the windows and as dressings, wherever much exposed to the weather, had become very rotten. This has been patched in some places, and, if funds had allowed, all the windows on the south side would have been replaced. The east window was in so dilapidated a condition that Beer stone has been substituted for that from Caen. The glass also is new, that in the tracery being stained, the other parts being filled with cathedral glass, with the exception of the central light, which contains a coloured design, representing the Good Shepherd. The plain reredos, of Caen stone, has given place to a more ornate structure in Beer stone, with tablets, the centre arch having shafts of red Mansfield stone, the steps being of Portland stone. The heavy wooden communion-rails have been replaced by light ironwork, by Singer, of Frome. The centre aisle has been laid with red and black tiles, by Webb, of Worcester. The works have been carried out by Blowey & Son, of Buckland Monachorum, under the direction of Mr. James Hine, architect. The carving was done by Hems, of Exeter.

Parkstone.—Plans for the rebuilding of Parkstone Church, Dorsetshire, are being prepared by Mr. Frederick Rogers, architect, London, and in all probability operations will begin at once, as the subscriptions already promised amount to about 1,500*l.* The contemplated structure will be on a much larger scale than the present edifice.

Pontypool.—It is proposed to enlarge St. James's Church, Pontypool, by adding a new aisle capable of seating 140 persons, which, with the additional seats gained in the gallery by the removal of the choir to the chancel, will increase the accommodation by nearly 200. Plans have been prepared by Mr. Deacon, the

architect, and approved of by the committee; and it is expected that the work will be commenced by the 1st of March.

Portland.—The Vestry of St. John's parish, on the 20th ult., decided to effect considerable alterations and improvements in St. John's Church, from plans prepared by Mr. J. R. Crickmay, the diocesan architect, which provide for an apsidal chancel, 20 ft. by 18 ft., with a south-east porch, and a vestry and organ-chamber on the north side. The organ-chamber will have arches opening into the church and chancel. A new pulpit, lectern, and reading-desk, complete the contemplated alterations.

Newtimber (*Sussex*). — This church has been reopened, after restoration. The plan is, like many Sussex churches, a simple oblong, with no chancel-arch. The date is early thirteenth century. New roofs of a high pitch have been put on, that of the chancel being boarded and panelled with oak. The chancel seats are of oak; the floors of tiles; the altar dais is of polished Derbyshire marble. The reredos consists of three moulded arches, enclosing paintings in oil on slate panels, by Mr. Daniel Bell, representing the Adoration of the Lamb. The builder employed was Mr. Steer, of East Grinstead, under the architect, Mr. R. Herbert Carpenter.

Topsham.—The re-building of the Church of St. Margaret, Topsham, Devonshire, which was commenced in December, 1874, is making good progress towards completion. The church is being rebuilt in two halves or portions, so as to allow of a continuity of services. The first portion is now nearly complete. All that will be retained of the old church will be the tower. The work at present in hand includes the chancel, chancel aisles, and transept. The new church will be cruciform on plan, the tower abutting into, or rather against, the south transept upon its western side. The exterior walls are of nobbled limestone, the quoins and plinth being worked in the same material. All the dressings are of Bath stone, and the roofs are covered with grey slates capped by dark ridge tiles. The style adopted by the architect, Mr. Edward Ashworth, is Decorated Gothic. All the dressings are of fine Corsham Down stone, the walls being stuccoed. The roofs are open, and of timber, springing from carved corbels. There is a considerable amount of stone carving inside the church, all of which is naturalesque in type, and has been executed by Mr. Harry Hems and his assistants. All the old monuments, interesting memorials of a by-gone age, have been carefully preserved and re-fixed. The contract is being carried out by Messrs. Stephens & Sons, contractors, of Exeter, Mr. John Reed being their managing foreman. The clerk of the works is Mr. R. Bradford.

Abbeydale (*Notts.*).—The new Church of St. John, Abbeydale, which has been erected at the sole cost of Mr. John Roberts, of Abbeydale Park, has been consecrated by the Bishop of Lichfield. The church is a substantially-built stone edifice, in the Early English style, and consists of nave and chancel under a continuous roof, surmounted by a bell-turret. There is only one entrance, which faces the south. The roof is partially open, the principals springing from carved corbels. The seats are after the most modern style, with sloping backs. The wood used is pitch pine, French polished. The chancel is divided from the nave by ornamental rails of brass. The eagle lectern is of massive design, also in brass. On the right hand is the pulpit, of pitch pine, carved. The reading-desk, on the left of the chancel, is raised on steps above the choir stalls, which are also carved, and are capable of accomodating 28 choristers.

Iden.—The parish church of Iden, near Rye, has been closed for the past seven months, during restoration, the cost of which has been about 1,000*l.* The re-opening took place on the 27th ult. The architect under whom the restoration has been effected is Mr. A. Smith, and the builder was Mr. Bourne, of Woodchurch.

Dunston (*Lincolnshire*).—This church has been consecrated, having been, with the exception of the tower, entirely rebuilt. The new church is nearly double the size of the old one; but in the rebuilding the greatest care has been taken to preserve and rebuild, stone by stone, the ancient arcade, porch, south doorway, buttresses, and fine "Easter sepulchre." The plan of the old church consisted of a nave and north aisle of equal length and width, a modern apse, and west tower. The nave and north aisle are now extended a bay, and a south aisle is added, with a new chancel, priests' and choir vestries, and organ-chamber. The ancient parts are of First and Second Pointed dates, and these have been followed in the new work. The walls are faced with coursed local stone, inside as well as outside, with dressings of Ancaster stone, and the internal shafts of the windows are of Derbyshire marble. Tiles are used for the floors, with steps of polished Hopton Wood stone. Towards the cost the Marquis of Ripon contributed 3,500*l.*, and the Ecclesiastical Commissioners 500*l.* The works have been carried out by Messrs. Halkes, of Dunston, under Mr. R. Herbert Carpenter, architect, Mr. Chapman being clerk of works.

SCHOOL-BUILDING NEWS.

Glastonbury. — New National schools were opened at Glastonbury on the 13th ult. Messrs. Wainwrights & Heard, of Shepton Mallett, were the architects, and Messrs. Merrick & Son, of Glastonbury, the builders. The total cost has been 1,003*l.* 9*s.* 5*d.*, in addition to 35*l.* 6*s.* 6*d.* for school fittings. The cost of the site, architects' expenses, gas-fittings, and other necessary disbursements, are estimated to amount to 375*l.* The schools, which will accommodate 270 children, are Gothic in style, and substantially constructed. The exterior is faced with blue hammer-dressed stone, with Doulting freestone dressings, and the roofs are covered with plain tiles. There are two school-rooms, one for the boys and the other for the girls, each 35 ft. by 18 ft., and 13 ft. high inside wall, and about 25 ft. to apex of roof. There are also two class-rooms, each 18 ft. by 14 ft. Large and spacious playgrounds are provided.

North Stoneham.—The new schools for the parish of North Stoneham, Southampton, are now completed, and were opened on the 10th ult. They comprise separate rooms for boys and girls, 34 ft. by 18 ft. each, with hat and cloak rooms, and the usual offices attached. The buildings, including a master's residence, are erected of local bricks, and have ornamental tiled roofs, surmounted by a bell-turret covered with oak shingling. The bell is the gift of the architect, Mr. Charles Pink, of Winchester. The works have been carried out by Messrs. Brinton & Bone, under the supervision of Mr. Thomas Micklam as clerk of the works.

Everton.—On the 18th ult. the memorial stones of the Primitive Methodist schools, Everton village, were laid. Space is provided for erecting a building 75 ft. long, 33 ft. wide, and parallel with the chapel. On the ground-floor there will be six class-rooms, a committee-room, and kitchen. The school-room is on the first floor, being 73 ft. long, 30 ft. wide, and 20 ft. high. The principal entrance to the school will be from a staircase 4 ft. wide, situated in the tower at the angle, the entrance doorway being in the centre of the principal *façade*. The elevation in front will be carried out with red patent brick and Stourton stone dressings, the angle nearest the chapel finishing with a tower and campanile roof, 60 ft. high. The contract is being carried out by Mr. A. Hall, and the architect is Mr. Richard Owens.

Kilmuir-Easter (*Inverness*).—The new school-buildings for Kilmuir-Easter have been contracted for as follows:—For the Kilmuir School—John Campbell, Portleich, mason; H. & A. Ross, Tain and Invergordon, carpenters; William Ross, Alness, slater; Macrae & Son, Tain, plumbers; J. Munro, Tain, plasterer; H. A. Ross, Tain, painter; D. Mackintosh, Inverness, bell-hanger. The Tullich School—W. Fraser, Tain, mason; H. & A. Ross, Tain and Invergordon, carpenters; William Ross, Alness, slater; A. Meikle, Tain, plumber; John Reid, Tullich, plasterer; H. A. Ross, Tain, painter; D. Mackintosh, Inverness, bell-hanger.

Handsworth.—A new middle-class school for boys was opened at Handsworth on the 24th ult. The buildings have been planned by the architect, Mr. W. T. Foulkes, of Birmingham, so as to be capable of being used for the purposes of assembly-rooms, suitable for concerts, lectures, balls, parties, &c. The school-hall is 50 ft. in length by 26 ft. in width, and is 26 ft. high to the collar-beam of the ceiling. The roof ceiling of the hall is divided into compartments by wrought principals and mouldings, with intersecting similar mouldings running along the ceiling. The hall is lighted by means of side-brackets and a pair of pendant coronas executed by Messrs. Proctor & Platt. The work has been carried out by Mr. Thomas Hughes, builder, Hockley.

Consett.—New National Schools at Consett, co. Durham, have just been completed and opened. Owing to the limited area of the site available, it was found necessary to arrange the schools in two stories, in order to avoid encroaching on the site of the church. Accommodation is provided for 375 children, allowing the minimum area per child required by the Education Department. The infants' school is on the ground-floor, and will hold 188, and is provided with large and small galleries, and other necessary fittings. The mixed school, or school for senior scholars, is over the infants' school, and is approached by a double staircase. The mixed school-room has been arranged with a view to its being utilised as a public room when required, and by an arrangement of folding-doors at one end of the school a class-room is obtained. The style is a free treatment of Gothic. The buildings have been designed and their erection superintended by Messrs. John Smith & Son, architects, Shotley Bridge. The contractors are as follow:—Mr. W. Shell, for mason's work; Mr. J. Routledge, joiner's work; Mr. J. R. Smith, plumbing and gasfitting; Mr. G. Nicholson, slating; Messrs. E. & D. Ormerod, plastering; and Mr. Richard Walker, painting and glaziing. The hot-water apparatus is by Messrs. Dinning & Cooke, of Newcastle.

Bishop's Stortford. — Extensive works, comprising both additions and alterations, have just been completed at the Nonconformist Grammar School, Bishop's Stortford. The old kitchens and out-offices, which were totally inadequate to the increasing requirements of the establishment, have been pulled down, and new kitchens, sculleries, &c., with dormitories and private apartments for the matron over, have been erected in their place; while an additional block of buildings, containing three class-rooms, library, lavatory, and cloak-room, with separate studies for the masters and elder boys on the first-floor, has been erected and connected with the present building by a covered way. The new buildings are of red brick, to match the old work. The kitchens, sculleries, &c., have been paved with Victoria stone, and the class-rooms and library floors are of wood blocks on concrete. Accommodation is now provided in the school for 150 boarders. The cost of the additions will be about 2,800*l.* Mr. John Slater, B.A., of London, is the architect; and the contractor is Mr. J. L. Glasscock, of Bishop's Stortford.

Hythe.—The memorial-stone of new Congregational Sunday schools was laid at Hythe on the 31st ult. The site is at the rear of the Congregational Church in High-street, and the building will comprise an upper school capable of seating 400 adults and an infant school to seat 150 children; besides a minister's vestry and a large class-room divided by folding-doors into smaller class-rooms. The entire cost, exclusive of land and fittings, will be 1,335*l.* The architect is Mr. Gardner, of Folkestone; and the contractor, Mr. Amos, of Hythe.

West Coker.—A new national school has been opened at West Coker, Dorsetshire. The building, which is Gothic in style, is of Ham stone, and is capable of accommodating 300 children. The entire cost amounts to about 1,000*l.* The architect is Mr. Henry Hall, of London; and the builder, Mr. S. G. Bartlett, of West Coker.

Teddington.—The school accommodation for this parish has recently been brought up to the required standard by the erection of an infant school building for eighty children, in the outlying district of South Teddington (and used as a mission church on Sundays), and by the erection of an infant school for 160 children, with class-room, &c., in connexion with the group of buildings known as the public schools, in Upper Teddington. A detached residence has also here been built for the master of the boys' school. The works have been carried out from the designs of Mr. T. Goodchild, architect, Adelphi, by Mr. F. James, builder, New Hampton.

Newhall. — The memorial stones of a new Primitive Methodist school-room at Newhall, Derbyshire, have been laid. The school is the first of a group of buildings which will ultimately include a new chapel, vestries, &c. Mr. J. Kerridge is the architect.

Tarrington.—The new schools which have for some time been in course of construction at Tarrington have recently been completed. They are provided by Lady Emily Foley for the benefit of the parishes of Stoke Edith, Tarrington, and Dormington. The buildings consist of a mixed school, 40 ft. by 20 ft., for 100 children, a large class-room for forty-seven children, an infant school for forty children, with cap and

cloak room, and a master's house adjoining. The house has parlour, kitchen, scullery, washhouse, three bedrooms, and the usual offices. The earth system has been adopted for the closets, a separate building having been designed for carrying it out in the most complete manner. Playgrounds, with covered play-sheds, are provided, and these last, together with the approaches to the different entrances, are laid with asphalte. The buildings are of brick, covered with slates. They have been purposely kept plain in appearance, the desire of Lady Emily Foley being to make them simple and substantial, with all modern appliances for education, cleanliness, and the health of the children. Ventilation is chiefly provided by means of the Galton stoves. The school furniture is by Lewis, of Ross. The cost of the whole work, including boundary walls, paths, school furniture, and apparatus, has been nearly 2,800*l*. The contractors were Messrs. Collins & Cullis, of Tewkesbury, who have executed the work under the supervision of Mr. Thomas Blashill, architect.

SOUTHERN EMBANKMENT OF THE THAMES.

MESSRS. WIGGINTON & ROWLEY have submitted a plan for the Southern Embankment of the Thames, and the formation of Commercial Docks. The principal difficulty hitherto experienced in devising any plan for the protection of the low-lying portion of the southern bank of the Thames, which suffered so fearfully from the inundations caused by the late and other high tides, has been that of dealing with the warehouse property fronting the river, so as not to interfere in any way with the transaction of the gigantic businesses there carried on. This has led the designers to an earnest investigation of the matter, resulting in a plan showing a series of docks, if subdivided, or one long dock from London Bridge to the Albert Embankment,—the same plan, with modifications, being applicable to the river above the Albert Embankment to Chelsea. The engineering portion of the work would be the same as that adopted for the Victoria Embankment,—but instead of filling in the entire roadway, counterforts would be built from the river-wall inwards, and arches turned for the support of the roadway. The spaces thus left open could be utilised, if desired, by an inner wall, with projecting parts containing steps to same. Being made watertight, a large amount of goods could be stowed away, and loaded or unloaded with facility.

THE MARYLEBONE GUARDIANS AND THEIR ARCHITECT'S COMMISSION.

AT the meeting of the Marylebone Board of Guardians, on the 11th inst., a long report was presented from the Reconstruction Committee with reference to the rebuilding of that portion of the workhouse the frontage of which is in Northumberland-street, and recommending that in consequence of certain extra works found necessary to be carried out, an application be made to the Local Government Board for their sanction to the borrowing of an additional 15,000*l*. In the course of the discussion, Mr. Galsworthy observed that he was glad to find that the committee had thought it wise to cut the architect's estimate down by 1,000*l*. As regards the commission they were paying to the architect, that was the most serious item in the matter, and he hoped the committee had fully considered it. He did not wish to cut any gentleman's fees down, but they must look well after themselves. If no action had been taken, he thought something must be done, for to pay a commission of 5 per cent. on such an undertaking as that was far too high. It was true that the building operations had commenced, and difficulties stood in their way, but if it was pointed out that the matter was an oversight, Mr. Snell might see his way to a compromise. If he did not adopt that view, of course it would be for them to consider the matter in future undertakings. The report was adopted.

The Glasgow Lath-splitters. — A conference was held between masters and men in this trade on the 5th inst., when the masters offered an advance of a halfpenny per hour and an agreement for three months, which the men accepted. They resumed work on the 7th inst., after being a week out.

THE SLATE TRADE OF NORTH WALES.

NOT for many years, it is stated, has this branch of trade been so prosperous as at present. At all the quarries of Merionethshire and Carnarvonshire the men are fully employed, and were it possible to double the quantity of slates turned out there would be no difficulty in effecting sales. This largely-increased demand has arisen in a great measure owing to the extensive building that is going on in the principal towns in the kingdom. As some indication of the rapid advances in value, it may be mentioned that the description known as "small ladies," which in 1872 sold at 35*s*. per thousand, cannot now be obtained under 60*s*. per thousand, and all other qualities have advanced proportionately. Up to the present time the Festiniog Railway has been the sole means of communication to the principal quarries, but the other railway companies are beginning to be alive to the importance of the trade, and the London and North-Western Company are constructing a line which will materially shorten the distance between the slate district and the chief inland markets of the country. A new line, to connect with the Great Western at Bala, is also spoken of.

AN ARCHITECT'S ASSISTANT'S CLAIM.

HANCOCK *v.* TREHEARNE.

IN this case, heard in the Marylebone County Court on the 9th inst., the plaintiff sought to obtain 15*l*. 10*s*. 4*d*., for work done. The defendant paid 6*l*. 2*s*. 10*d*. into court, and denied further liability.

The plaintiff stated that he went to assist the defendant in getting out some drawings in the year 1873, and was to receive 1*s*. per hour. The engagement was for three days, but he stopped there for several months, and had his salary raised to 1*s*. 3*d*. per hour. When he left the defendant the first time he was not settled up with, but got the balance when he went to work for the defendant again about four months afterwards. From the first, until the May of last year, he continued to work for the defendant, on and off, and occasionally made him out a bill and received a cheque at same time. In all his bills he charged the defendant for the hour he occupied in getting his dinner, and also for the half-hour he took at tea-time when he worked after five o'clock at night, and no complaint had ever been made to him by the defendant for so doing; and, in fact, it was usual to do so. Sometimes he worked only two hours a day, at other times five or six hours, and occasionally as long as twelve or thirteen hours, but he never charged for dinner-time when he worked only for an hour or two.

The Judge.—It seems strange to me that a man employed to work by the hour should charge for his dinner-hour.

The defendant, an architect and surveyor, of Great Russell-street, did not deny employing the plaintiff, and said that he was recommended to him by a friend of his, and when the plaintiff made out his bill he never looked into it, but took it for granted that it was all right, and under those circumstances paid him. He was in entire ignorance of the meal-times having been charged until the last account was sent in, when the largeness of the amount claimed led him to inquire into the matter. Three witnesses were called by the defendant to show that the charging for the meal-hours was contrary to all custom or rule.

The Judge said he could not by his judgment encourage a system by which persons employed could claim for time occupied in having their meals, when their hiring was clearly for the purpose of producing labour.

Judgment for the defendant.

The Halifax Skating Rink.—The excavation of the ground for this rink, which will be one of the largest in England, is rapidly proceeding. Entering the ticket-office, in Arden-road, and by Crossley Almshouses, one will come upon the open rink, 95 ft. by 135 ft., having on two sides a covered colonnade. Eight arches, on the west side, the open rink, give access to the covered rink, 64 ft. broad by 140 ft. long. The roof, of 64 ft. span, with laminated wooden ribs, will be 40 ft. from floor to ridge. Retiring-rooms, skate-rooms, dressing-rooms, &c., will be provided, and altogether the establishment will be most complete. The architect is Mr. W. S. Barber.

Books Received.

Thrift. By SAMUEL SMILES, author of "Self-help," &c. John Murray. 1875.

THE author of this book, whose name is now almost a household word among a large section of English readers, is one of those writers who produce a more or less distinct effect upon the habits and thoughts of their own generation, by the main force of persistence in the proclaiming of some important and (as they believe) neglected principle, backed by the weight which is always lent to such an effort by an evidently sincere conviction and honest purpose. In his "Self-help," and "Character," and still more conspicuously, perhaps, in his graphically-written and sympathetic life of George Stephenson (his most permanently valuable work), Mr. Smiles has, with a manly simplicity and earnestness, preached the doctrine of *la carrière ouverte aux talens*, and called upon his fellow-men, those especially who are not born to independence or affluence, to consider and realise the power which lies in diligent and well-directed effort in the path of duty and hard work. He now returns to the charge in the present volume, intended as a sequel to the two above-named; "for Thrift is the basis of Self-help, and the foundation of much that is excellent in Character"; and, considering that "some of the finest qualities in human nature are intimately related to the right use of money," he thinks the lesson is worthy of being repeated and enforced. The book consists mainly of the putting together of various instances of success in life from humble beginnings, together with some more general and in many places eminently true and sensible remarks upon certain aspects of modern society, more especially on the mania of "keeping up appearances"; an *ignis fatuus* which has brought many of its victims to distress and even disgrace. The evil, he observes, does not stop with the moneyed classes:—

> "It descends to those who have nothing but their salary to live upon. It descends to the wives of clerks and shopmen. They, too, dress for respectability. They live beyond their means. They must live in gimcrack suburban villas, and 'give parties.' They must see what is going on at the theatres. Every farthing is spent as soon as earned; sometimes before. The husband does not insure his life, and the wife runs into debt. If the man died to-morrow, he would leave his wife and children paupers. The money he ought to have saved during his life of toil is spent on 'respectability'; and if he leaves a few pounds behind him, they are usually spent in giving the thriftless husband a respectable funeral."

These are sharp truths pointedly told, and so is the following sentence:—"'Is that dress paid for?' asked a husband. 'No.' '*Then you are allowing yourself to be clothed at another man's expense.*'" Which is what half society is doing continually. At the same time, we do not see why the thrifty family should not "know what is going on at the theatres" sometimes, and be all the better for it. It is a false and mistaken thrift which would consider a little money spent on an intellectual recreation (if we can still class the theatre so) as money thrown away. And there may be a good side which Mr. Smiles overlooks, in the desire for keeping up at least the best style of living which circumstances admit of. It may arise in some instances out of no false pride or "snobbishness," but out of a natural and genuine desire to give something a little more ornamental to every-day life than the average. There are two sides, also, to the question of "circles," against which the author is bitter. As he puts it, indeed (p. 237, &c.), every word is true in his animadversion; but, on the other hand, there is the incontestable fact that different classes of persons in the world do form such different associations, ideas, and standards of taste and manners that intimate intercourse between them is impossible with any ease or pleasure to either side. If society is to be more assimilated and united in these respects, it must be by levelling up the standard of culture, not levelling it down. Such a consummation is devoutly to be wished, and perhaps possible, but not for a long while yet.

The pith of what is incontestably excellent in Mr. Smiles's book is summed up in the last couplet of the strong sturdy verse of Burns which he places on his title-page, where the true object of thrift is defined as,—

> "—— the glorious privilege
> Of being independent."

But let it not be forgotten that he who learns to worship thrift as an end and not as a means (no uncommon error), is subjecting himself to a yoke almost as bad in its way as poverty, a bondage of the spirit which strikes at the root of the most

real and noble independence. It is true that no epithet conveys a greater stigma of weakness and worthlessness in a character than that of "thriftless"; but it is equally true that no more cutting and contemptuous sarcasm can be found in literature than that which the greatest poet breathes through the lips of his greatest character —"Thrift, thrift, Horatio!" Let us be thrifty, by all means, and let us thank the honest and persevering Mentor who inculcates the lesson; but let us not forget, all the same, that there are higher and nobler qualities of character than this, valuable as it unquestionably is.

VARIORUM.

"Laxton's Price Book" gets fatter, so to speak, every year, but this is not to be taken as a sign of weakness, but evidence that it contains an increased number of good things. The edition for 1876 just now issued (the 59th) fully maintains its position.——The City of London Directory contains a large amount of useful information not to be met with in any other work of a similar character. Not only is every firm carrying on business in the City duly described, but the names and addresses of individual members of each firm are also given under the proper headings. We have so often spoken well of it that we need only say of the new issue for 1876 that it appears to have been corrected to the latest date, and includes the statement of dividends declared within three hours of the work going to press.

Miscellanea.

Overcrowding in Birmingham. — An inquest was recently held in Birmingham on the body of the wife of a bellows-repairer, living in No. 8 Court, Smallbrook-street. The deceased's husband, a decrepit old man, stated that his house contained only two rooms—a kitchen and one bedroom. In this dwelling, deceased, himself, a son aged twenty, and a daughter aged seventeen, had lived for the past eighteen months. Witness was in the habit of sleeping upon an old pair of bellows, placed near the fire in the kitchen, whilst the other three members of the family occupied one bed in the room alone. The coroner, in addressing the jury, said:—"We have been to the tenement in which this poor woman resided, and where her husband and two others of the family lived. We have seen that wretched hovel, and it seems to be one of a dozen hovels running in a line in the midst of a somewhat dirty undrained court. The row of houses seems to be situated almost immediately behind the hotel, which is in Smallbrook-street. In this street there are living, or carrying on business, five members of the Birmingham Town Council. There is no other street in the town so honoured as Smallbrook-street. From the top to the bottom, in the middle, right away through it, and at each end of the street there are town councillors, magistrates, ex-mayors, and aldermen; and they all live within a stone's throw of this shocking place which we have visited."

Carlisle Castle.—Extensive works are in progress at Carlisle Castle. The interior of the keep has been converted into an armoury for the reserve forces, &c., the floor has been lowered 2 ft. 6 in., and stands for about 1,800 arms and outfit are erected. In the centre of the western wall, 11 ft. thick, a stone staircase has been put up to communicate with an upper story, and the windows have been widened in order to admit more light. The barrack-sergeant's quarters and a gun-shed on the west side of the yard have been demolished, and in their place now stands a new officers' mess, built of red stone. At the north-east corner of the yard a large brick building is being erected, and is nearly completed. It consists of a canteen for the men of the regiment, recreation-room, with reading-room above, and two barrack-rooms to accommodate thirty-six men. The old armoury at the entrance to the castle has been converted into a sergeants' mess, and additions are to be made to the hospital, and quarters built for the hospital sergeant and cook. As soon as the property in Annetwell-street is free of tenants, it is intended to make the entrance to the castle the same width as Castle-street, and build quarters for sixty or seventy married men. Mr. T. B. Nelson is the contractor; Major Nelson, R.E., the engineer; and the work is being carried on under the immediate superintendence of Mr. Stockwell.

Railway Construction in the United States.—The progress of railway construction in the United States has been seriously checked by the stagnation of business that has now lasted for more than two years. In 1872, the year before the panic, when speculation was at its height, and capital was eagerly seeking investment, no fewer than 7,340 miles of new lines were added to the railway system of the Union. In 1873 the amount of increase fell to 3,883 miles; in 1874 there was a decline of 2,025 miles; and in 1875 only 1,483 miles were opened. Thus the increase of mileage in 1872 was almost precisely equal to the aggregate increase in the three succeeding years. It is observable that of the mileage added in 1875,—the smallest recorded,—three-fourths were completed in the latter half of the year. This shows that the depression was greatest twelve months ago,—indeed, that railway construction was almost at a standstill,—and that there are now signs of revival. The collapse, however, may be regarded as affecting only the States of the Upper Mississippi Valley and the South. In New England, the middle States, and the States beyond the Rocky Mountains, the progress of construction was maintained steadily enough, considering the financial difficulties of the panic, and the fact that in the more thickly-peopled States there is a diminishing demand for new lines.

Building Prospects in Perth.—There is stated to be every probability of the building and kindred trades of Perth having abundance of work for many months to come. Extensive additions and alterations are about to be commenced at the barracks, involving an expenditure of upwards of 20,000*l*. It is believed that part, at least, of the contract has been obtained by an Edinburgh firm. It is also in contemplation to make a large addition to the general prison in the form of a four-story building to be used as a hospital. Another Government job, the addition to the post-office, has been settled, the contract for the work having been signed by Mr. Johnstone, joiner, Perth. Plans have now been adopted for the new drill-hall in South Tay-street, the committee appointed for this purpose having approved of the plans of Mr. Chalmers, architect. The building will have a frontage of 80 ft., the main portion being two stories, with side wings of one story. It is also stated that plans for Free St. Stephen's Church at Paradise-place have also been adopted. An effort is being made to provide the Baptist congregation with a new church, and in addition to these public buildings, there are several other private jobs in prospect, including some villas and a new public work in Glasgow-road.

The Court of Appeal on Rating of Mansions.—The ruling of the Court of Appeal in the case of Clive *v.* Foy has (says *Land and Water*) introduced a very important change in the law of rating as applied to large mansions. Up to the present time assessment committees have always held that the words of the statute—that the rateable value of a property should be what it "might reasonably be expected to let for from year to year," meant that they had to estimate what a tenant would give for it for one year and no more. In the case of very large houses it is evident that nobody would give anything for them on these terms. Assessment committees, therefore, were obliged to fix some almost nominal value, which was usually about the largest rent actually given for any house that might be let in the neighbourhood. This has always been held to be the law ever since the statute was passed, and country mansions have always been rated on this principle. But in the case in question the Court has, of its own accord, added a very important rider, which, practically, changes the law entirely. They hold that "the sessions may take into consideration the number of years for which a tenant from year to year may reasonably be expected to continue tenant," and in the particular case in point they fix this as seven years.

Death caused by a Lead Pencil.—A St. Pancras vestryman, Mr. Joseph Smith, died on the 7th inst. His death was occasioned in a very singular manner. It appears that, a fortnight ago, Mr. Smith was hurrying along a street, when a lead pencil, which had got into the lining of his coat, wounded his knee. Though the hurt was painful, he delayed having it seen to for a week, when he was laid up. The knee swelled to a large size, and a doctor lanced the wound, but erysipelas followed. On the following day mortification set in, and the deceased expired in an unconscious state.

The Baptistery at Ravenna.—The attention of the Government has been called to the condition of the Baptistery of Ravenna, a monument of high importance as regards the history of art. According to the *Times* correspondent, the mosaics of the fifth century it contains are rapidly perishing, and, in fact, the building itself is threatening ruin in consequence of the damage it has received in past times and the gradually increasing injury it is continually suffering from the damp, caused by the very low level on which it stands. With a view to saving the Baptistery from further injury, a project has been prepared by the Commendatore Lanciani, chief of the Department of Civil Engineers at Ravenna, which has just received the approval of the Minister of Public Works. It is proposed, after all the requisite precautions have been taken, to raise the edifice bodily to the modern level by means of a number of great screws worked simultaneously, new foundations to be built beneath it. This will be the first occasion of this means of raising buildings,—common in the United States,—being put into operation in connexion with an ancient edifice.

Alleged Trade Tyranny in Nottingham. An extraordinary case of trade tyranny is alleged to have come to light in Nottingham. It is stated that in November last all the hands employed by Messrs. Lewis, slaters, struck by order of their union, the reason assigned by the union for issuing the order being that the firm had employed a non-union man. Notwithstanding the denial of Messrs. Lewis, the union ordered the men not to resume work till Messrs. Lewis had paid a fine of 25*l*. Messrs. Lewis refusing to do so, the men remained out and were replaced by non-union hands. The Slaters' Union have now induced the amalgamated operatives to issue a circular to every employer in the building trade in Nottingham to the effect that if any firm should after this date buy or obtain materials of Messrs. Lewis, the whole of the men in every branch of their trade would strike and remain out till the materials were removed. Messrs. Lewis are taking steps to prosecute the issuers of the circular.

St. Marie's R. C. Church, Sheffield.—A new organ, presented by the Duke of Norfolk, has been placed in this church, on the north side of the chancel. It contains twenty-three spealting stops, viz., eight in the great organ, seven in the swell, six in the choir, and two in the pedal. It has also a tremulant acting in the swell registers, three composition pedals, and five coupling movements. The case is elaborately carved, and is Austrian oak, the pipes being spotted metal. The lower portion is an open traceried screen, behind which the organist sits, and the great organ is corbelled out into the chancel, and forms a canopy to the choir-stalls. The whole work has been executed under the direction of Messrs. Hadfield & Son, the architects of St. Marie's, by Messrs. T. C. Lewis & Co., of London, whose contract of 1,000*l*. also included the case, designed for them by Mr. Bentley, architect, and executed under his supervision.

A New Steam Dredger.—A trial of Dickman's patent steam dredger took place on the 10th inst. at Millwall, and is reported to have proved satisfactory. The peculiarities of the invention are, first, that the bucket apparatus is placed amidships; secondly, that the soil is discharged into two cylindrical tanks below deck; and thirdly, that it is pumped from these by means of a pneumatic pump through an iron pipe under the wharf and Millwall Extension Railway into a field some 150 yards distant. Its great recommendation is the speed with which the operation is performed, and the saving of labour which it effects, one man being sufficient to conduct the process of emptying the tanks after the hose connecting them with the cast-iron main on shore is adjusted. On the occasion of the trial the contents of the tanks, 200 cubic yards, were discharged into the adjacent field in the short space of twenty-two minutes.

Cement for Ovens.—A cement for covering the joints of ovens, which is said to be found excellent in practice and does not crack, but becomes very hard, may be made by mixing equal quantities of finely-sifted wood-ashes and crushed and sifted clay, and adding some salt and sufficient water to form it into a dough, with which the cracks are coated when the oven is cold. If this cement is employed instead of clay in setting new ovens they will be almost indestructible.

The Catacombs, Rome.—Between 731 and 816 no less than twenty-eight cemeteries were restored by the popes. Cemetery is the old name for catacomb, which is entirely a modern or Mediæval name originating in a misconception. The earliest Christian burial-place was under, or near to, the church of S. Sebastian, which was called "The Catacomb," because it was *Kata-cumba*, under the hill or *combe* on which the great tomb of Cecillia Metella stands. Twenty-eight catacombs were restored in the eighth and the beginning of the ninth century. The chief things to be restored in these burial vaults with their corridors or streets, which are for the most part cut out of the tufa rock, were necessarily the paintings, and therefore we find a large proportion of them to belong to that period. Another considerable part of these paintings are of the time of Pope John I., A.D. 523-526, who is recorded to have made the catacombs of SS. Peter and Adauctus, Nereus and Achilleus, and Saturninus, and restored that of Priscilla.

The Bolton Sewage.—The Corporation of Bolton, after trying one or more schemes for purifying the sewage of the borough, have finally adopted the precipitating process of the Clarifying and Utilisation of Sewage Company (Limited), Leeds, and at the last monthly meeting of the company a licence was granted authorising the corporation to work their patents. The population of Bolton is about 100,000, and the amount of intercepted sewage is estimated at 100,000 gallons per hour. The cost of purifying the same is about 30s. to 40s. per million gallons. Limited quantities of the refuse have been sold to agriculturists, and in a short time the sewage committee hope to be able to find a ready sale for all that they can produce.

How Epidemics might be Averted.—The medical officer of health for the Haslingden Union (Dr. Harrison) says, in his annual report submitted to the sanitary authority at their meeting on the 9th inst., that much of the usefulness of medical officers of health is impeded by their inability to obtain early and reliable information in respect of the outbreak of infectious diseases. The first information of an epidemic had to be gathered from the death-list, and by that time the disease had often gained such ground that it was found impossible to check its course. He urged that it should be made compulsory by Act of Parliament for householders to at once report cases of infectious disease to the local sanitary authority.

Public Spirit at Longton.—An incident of the meeting of the Longton Town Council, on the 3rd inst. is worth recording. It appears that a piece of land in the town excellently situated for public buildings, is in the market. The Council, having bought the gas-works, and being engaged on costly sewerage operations, have almost reached the present limit of their borrowing powers, and are not in a position to buy this land (for which 5,000*l.* are demanded), and also erect public buildings thereon. They might find the money for the buildings—say Public Baths and a Free Library, if the burgesses should so decree—but they cannot both buy the land and erect the buildings. Wherefore Mr. Alderman Hulse proposes that the site shall be acquired for the town by private subscription, and offers to head the list with 500*l.* It is to be hoped that Mr. Hulse's challenge will be promptly accepted by his well-to-do neighbours.

The Proposed Demolition of City Churches.—It may be remembered that at a recent meeting at Sion College, a report was adopted which practically recommended the removal of a large number of the existing City churches. Many of the fellows of the College, who are incumbents of benefices in London, have issued a protest against legislation based on the principles advocated in that report, which they allege omits to state how much has been effected under the provisions of the existing law for the union of benefices. Much having been done under a Permissive Act, they believe it would be inexpedient to resort to compulsion to effect the remaining unions that may be necessary.

A Recommendation Worth Heeding.—At an inquest held at Cardiff, on the 5th inst., it was shown that a boy, aged fourteen years, had been poisoned through inhaling the fumes of spelter while following his work at the coppersmith's shop of the Taff Vale Railway Company. The jury recommended that boys should not be employed at such work.

Bell-Chiming Apparatus.—A new chiming apparatus, invented by the Rev. H. P. Ellacombe, rector of Clyst St. George, Devon, has been fixed in the church of Moreton-on-Lugg, Herefordshire, by Messrs. Hooper & Stokes, church bell-hangers, of Woodbury, near Exeter, by which means the whole peal of six bells may be easily chimed for service by one person. Ball hammers are suspended beneath the mouths of the bells, out of the way of the swing of the bells, and by a system of pulleys the ropes connected with these hammers are brought down in parallel lines to a manual fixed on the belfry-wall. When the manual is put into gear for use, the ropes are all tightened, and the hammers thereby raised nearer to the bells, so that a slight pull at each rope causes the hammer to strike the bell. One person, therefore, standing in front of the manual, can readily chime all the bells by simply pulling rope after rope, or he can play a tune by varying the fingering of the ropes.

The Proposed Free Library and Baths, Wednesbury.—At a meeting of the Wednesbury Local Board on the 24th ult., it was resolved "that the site in Malthouse-street be purchased for a sum of 700*l.*, for the purpose of erecting baths and washhouses." Mr. W. Lloyd submitted plans of the site, from which it appeared that the total quantity of land to be bought would be over twelve hundred yards. A little more than eight hundred yards would be used for the baths and washhouses, and the remainder—something over three hundred yards—could be utilised for the purposes of a free library. About 305*l.* would be the actual purchase money for the land for the library. According to the plans, it was suggested that there should be only one bath—say sixty yards in length by twenty-two in width—instead of two. This would save much extra expense; a commodious bath would be provided, which upon certain specified days could be set apart for the use of the ladies. The outlay for the buildings is estimated at about 5,000*l.*

The Patent Laws.—On the 10th inst. a numerous meeting of the members of the Inventors' Institute was held for the purpose of discussing the present state of the Patent Laws, and determining upon the measures which ought to be taken to secure an amendment to the Act of last session. Sir Antonio Brady presided; he was supported by Admiral Selwin, Mr. Newton Wilson, Mr. Campin, and other gentlemen. In opening the proceedings, the chairman said that great dissatisfaction was felt at the results of the legislation of last year on this question. The Act did not secure to inventors the protection which they needed, neither did it reduce the cost of securing a patent, and in both respects an amendment of law was needed. After a discussion it was resolved that immediate action be taken for securing the introduction of a Bill into the House of Commons to amend the Patent Act of last session.

Archæological Discovery on a small scale is proceeding actively at Kadikeni. According to the *Levant Herald*, men, women, and children turn out, day after day, on to the beach under the cliffs of Moda Bay, where, for some time past, an incredible number of ancient coins, mostly Roman, have been discovered amongst the pebbles. As many as thirty have been picked up by one explorer in the course of a few hours. A few leaden ornaments, such as brooches, lockets, rings, &c., have also been found. It is uncertain whether these interesting objects were thrown up from the sea during the heavy southerly gales of December last, or have been washed down from the hillside by the rains. Most of the coins are of copper; but a gold one is stated to have also been discovered.

Philadelphia Exhibition.—Messrs. Wright & Mansfield have now on view, at their premises in Bond-street, the furniture to be exhibited by them at the Philadelphia Exhibition, comprising some choice pieces made in the English style of the eighteenth century. For example, a very fine inlaid mahogany sideboard; a mahogany and brass Louis XVI. lady's pedestal writing-table; a lady's inlaid satinwood wardrobe (a capital specimen of wood and workmanship); an inlaid satinwood cabinet; and many examples of chairs, *étagères*, &c., after Theraton, Hepplewhite, Chippendale, and Johnson.

A Water Supply for Otley.—The Otley Local Board, on the 8th inst., adopted a scheme for supplying the town with water, at an estimated cost of 10,000*l.*, and determined to apply to the Local Government Board for the loan of that sum for fifty years.

The Maidstone Cottage Improvement Company, Limited.—According to the thirteenth annual report, just issued, the net rental for the year, after paying for repairs, insurance, and other charges, has amounted to 798*l.* 13s. 7d. The working expenses have come to 16*l.* 9s., and a sum of 33*l.* 7s. 5d. for sanitary improvements at Barming, has been charged to the income account, so as not unduly to swell the amount charged to capital. The annual dividend of five per cent., free of income-tax, will take 644*l.* 12s. 6d., leaving 104*l.* 4s. 8d. as profit for the year, to be added to the reserve fund, which will also be increased by the dividend on the fund to 797*l.* 16s. 1d., exclusive of 40*l.* charged to the reserve fund as part of the loss incurred by taking down five cottages in Bonny's-yard.

The Liverpool Timber Trade.—At the weekly meeting of the Mersey Docks and Harbour Board, on the 10th inst., a memorial was read from thirty-nine firms in the timber trade, complaining of the want of dock accommodation for their business, pointing out how the trade had increased, and asking the Board to give them additional accommodation. A letter was also read from the secretary of the timber trade, enclosing a copy of a resolution passed by that body, asking that, as the importation of deals and sawn timber had so considerably increased, the bye-laws of the Board should be so altered as to admit of the discharging of that kind of timber at the upper quay as well as at the lower. The memorial was referred to the works committee; and the letter and resolution to the quays committee and the traffic committee.

Working Men v. Steam.—A memorial, signed by no fewer than 19,000 dock labourers, was read at the meeting of the Mersey Docks and Harbour Board, on the 10th inst. The memorial set forth that the steam-engines placed on the dock quays to assist in the discharge of ships greatly lessened manual labour, and imposed great hardships on working men, who had large and helpless families dependent on them, and on these grounds the board were requested to remove them. The secretary was instructed to reply to the memorial, pointing out that the subject could not be entertained. This complaint shows indeed retrogression.

New Reredos at Cambridge.—A carved oak reredos, from the design of Mr. G. G. Scott, has recently been erected in the church of St. Mary the Less, Cambridge. It is of Belgian oak, and was executed by Flemish artists at Bruges, under the direction of Messrs. Buckley & Co., London. The reredos consists of five compartments or panels, with open cresting above. Each compartment contains a statue: Our Lord in the centre, with St. John and St. Peter on either hand; and beyond them St. Mary and St. Gabriel. These figures are in coved recesses, with canopies and tabernacles of delicate character.

Mr. Ruskin's Sheffield Museum.—In the February number of *Fors Clavigera*, Mr. Ruskin announces the appointment of Mr. Henry Swan as curator of the Sheffield Museum, at a salary of 40*l.* a year. Mr. Swan was an old pupil of Mr. Ruskin's in the Working Men's College, London, and has since been known to him as an estimable and trustworthy person. At present Mr. Swan is obliged to live in the lower rooms of the house which is to be the nucleus of the museum; but as soon as the St. George's Company can afford it, a curator's house will be built.

New Bridge at Dumfries.—A new iron foot-bridge across the Nith, to connect the southern portion of Dumfries with Troqueer, has been opened. The structure is of the usual suspension form,—203 ft. in length, and 6 ft. 6 in. wide, with the sides of trellis-work. At each end of the bridge, between the large pillars, is erected an ornamental lamp. Beneath is a cast-iron archway. The cost will be about 1,800*l.* Mr. J. Willet is the engineer.

Piecework in the Building Trades at Plymouth.—The masons and plasterers in Plymouth and Devonport have given notice that they will no longer do piecework, but must be paid day wages; also, that if any master or foreman is found measuring the work of any man, or party of men, to see how much they have done, the whole of the men on the job will be called off. In consequence of the threatening aspect of affairs the new South-Western Railway Terminus at Plymouth is, it is said, to be built of wood instead of stone.

The Sewerage of Harwich.—It is stated that at a recent meeting between a deputation of the Town Council and the directors of the Great Eastern Railway on the question of proposed drainage, the latter gentlemen gave preference to Mr. Bruff's scheme (which is on the principle of precipitation), on account of its being less expensive than the irrigation scheme also laid before them, and because it would be less likely to interfere with works which the company propose carrying out at Ray Island.

Monumental.—On Saturday last, the statue of Colonel Akroyd, late M.P. for Halifax, one of the last important works of the late Mr. John Birnie Philip, was cast in bronze at the Manor Ironworks, Manor-street, Chelsea. The *pose* is excellent, and the likeness very striking. At this same foundry, whence have proceeded the bronze statues of Ross, Outram (for Calcutta), Lawrence, and Palmerston (recently erected at Westminster), a statue of Livingstone, by Mrs. Hill, has been just now cast.

Burntisland Dock Works.—Additional tenders have been advertised for to complete the works. These amount to 24,000*l.* odd. It only remains now for the Council to give the word for the execution of these extra works to have the dock ready for next season's traffic. The North British Company have gracefully abandoned their Transfer Bill, and all is therefore settled as it should be.

A New Court-house for St. Helen's.—In connexion with the new Town-hall at present in course of erection at St. Helen's are the Police-offices and Court-room, and these have been completed and formally opened for business. The architect for this, as well as the Town-hall proper, is Mr. H. Sumner; the contractor, Mr. George Rome; and the clerk of works, Mr. Richard Wood, all of Liverpool.

An Engineering Firm.—Mr. Edward Field, C.E., has taken into partnership his brother, Mr. Walter Field, and Mr. F. M. Cotton, M.I.M.E., who have been engaged with him for many years, and the business hitherto carried on by him as consulting engineer will be continued under the style of Field, Field, & Cotton, consulting engineers.

The late Mr. Cheverton.—Mr. Benjamin Cheverton, sculptor, died recently at his residence in Upper Holloway, aged 81. The deceased is best known by his excellent mechanical reductions. The interment took place at High-gate Cemetery.

Royal Scottish Academy.—A meeting of the Royal Scottish Academy was held in Edinburgh on the 9th inst., Mr. Macleay presiding, when Mr. Daniel MacNee, the portrait-painter, was unanimously elected president of the Academy, in room of the late Sir Geo. Harvey.

Cork.—We understand that Mr. Burges has received instructions to complete Cork new cathedral, and that money is ready for the purpose.

Death of Mr. Edmund Bristow.—Mr. Edmund Bristow, the landscape-painter, died at Eton, in his ninetieth year, on the 12th instant. The deceased was born at Windsor in 1786.

A Lift Accident in Bradford.—Last week a boy was descending in a lift, when the rope broke; he fell with the cage through six stories, and was killed.

TENDERS

For presbytery, Buxton, for Rev. J. Power. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Gillard:—

Gladwin	£1,344 0 0
Gothard	1,305 0 0
Marsh	1,290 18 5
Barker	1,290 0 0
Pattinson	1,275 0 0
Izzard & Morten	1,251 0 0
Billiange	1 235 0 0
Hutton	1,200 0 0
Brown	1,195 0 0
Gill	1,105 0 0

For Bible Christian church, school, &c., Barrow-in-Furness. Mr. Howard Evans, architect:—

Ward	£2,947 12 7
Gilchrist	2,877 0 0
Saddler, Wood, & Andrews	2,555 0 0
Gradwell (accepted)	2,550 0 0
Henderson	2,503 15 0

For erecting stables, &c., at the Old Parr's Head, Blythe-lane, Hammersmith, for Mr. Carthew. Mr. F. W. Hamilton, architect:—

Stimpson & Co.	£333 0 0
Nash	330 0 0
Hutchings	315 0 0

For Billingborough schools. Mr. Ernest Carritt, architect:—

Glade	£3,302 0 0
Webber	2,837 0 0
Cooke & Jillings	2,380 0 0
Plowman	2,340 0 0
Easter	2,334 14 0
Hinson	2,298 0 0
Hobson & Taylor	2,257 0 0
Cohen	2,243 0 0
Morris & Co.	2,232 15 10
Millson	2,195 0 0
Hinson	2,135 0 0
Young	1,998 0 0

For alterations and additions to premises, Commercial-road East, for Messrs. Ling & Son. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—

Coleman	£1,245 0 0
Manning & Dowdney	1,130 0 0
Merritt & Ashby	1,115 0 0
Ennor	1,095 0 0
Palmer	1,075 0 0
Hearle & Son	1,023 0 0
Morter	993 0 0
Hollist	990 0 0
Ashby & Horner (accepted)	920 0 0

For Monmouth Infants' School, Monmouth School Board. Messrs. Laurence & Goodman, architects, Newport, Monmouth. Quantities supplied:—

Bethel & Lewellin	£2,000 0 0
Stephens & Bastow	1,942 0 0
Jones & Co.	1,901 0 0
Biggs	1,793 0 0
W. Jones	1,672 0 0
White	1,560 0 0
Morgan	1,554 0 0
Roberts (accepted)	1,483 0 0

TO CORRESPONDENTS.

J. A. M.—R. L. R.—S.—M. L.—J. W.—C. S.—F. C.—A. R.—C. L. C. G. S.—D.—E. M. S.—J. & A. E. B.—J. E.—E. K. T.—E. W.—W. Son, & A.—R. I.—J. F.—O. S.—T. F. Mc C.—C. L.—R. A. C.—W.—S. J. (shall have attention when received).—J. S. (next week).—W. B. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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,, (Lombardy), 8, 10, 12, and 15 feet.
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